MAY 31, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Now Industry Must Take the Helm On Export Trade—

As U. S. cuts economic aid, which financed nearly 30 per cent of our postwar exports, it's up to you to develop foreign business—p. 50

✓ **MORE INDUSTRIAL MOVIES**
A Business Tool Improves, p. 52

✓ **TUBE BENDER FOR SHARP CORNERS**
Machine Is Real Saver, p. 90

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WHEN TEMPERATURE IS A PRIME FACTOR

Tube Selection Cannot Be Reduced to a Formula — Even a Complicated One

Many variables are involved in the selection of the optimum tubing for a specific high temperature application. If the tubing is also to operate under high stress, perhaps the most important variable to be considered is mechanical strength.

In general, the mechanical strength of a steel decreases as the temperature increases. Some steels, however, retain more of their strength at elevated temperatures than others. For instance, at 300F, the ultimate strength of both carbon steel and B&W Croloy 18-8 (Type 304) is about 70,000 psi. At 1200F, however, carbon steel is about 12,000 psi while Croloy 18-8 is about 44,000 psi.

To evaluate the characteristics of metals operating under stress at high temperatures and over long periods of time, B&W has performed stress rupture tests and creep tests on a great number of tubing steels.* The results of these tests help engineers to determine the proper tube to be used in specific applications.

Other factors beside mechanical strength, however, must be considered in choosing the optimum tubing for a specific high temperature application. Some of these factors are—oxidation resistance, tube size, tube cost, flow rates, and rates of conductivity and expansion.

It takes an expert to specify the right tubing for any particular application, and there is no substitute for the kind of experience with these problems you'll find at B&W.

To get the most benefit from B&W's long experience in matching tubes to jobs, call on Mr. Tubes, your nearby B&W Tube Representative. He can help you make the best choice.

Data shown in
TDC 102 Creep Stress Data on B&W Croloys

TDC 153 Stress Rupture Data on B&W Croloys available free on request.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

B&W SEAMLESS and WELDED TUBES

TA-4023 (P)

HOW THEY ADDED YEARS TO THE BOOM'S LIFE

Many a sidewalk superintendent has winced at the beating taken by excavating equipment, like this trench hoe built by Hanson Clutch & Machinery Co., Tiffin, Ohio. It takes a rugged boom and stick, for example, to absorb those jarring impacts and straining lifts day in, day out, with no downtime for repairs.

Wanting their product to stay on the job even in tougher-than-usual service, the Hanson people turned to Mayari R high-strength, low-alloy steel. They found that Mayari R, with its yield point of 50,000 psi, built a much stronger boom and stick than carbon steel, without increasing the weight. One of these Hanson units, operating with an oversize bucket, recently completed six years' service with its boom and stick still in excellent condition.

Mayari R can be fabricated and welded as easily as carbon steel, with the same equipment and methods. Tests show that its resistance to atmospheric corrosion is five to six times better than that of carbon steel. These and other facts about Mayari R are detailed in our new Catalog 353. Get in touch with the nearest Bethlehem sales office for a copy.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

BETHLEHEM STEEL

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

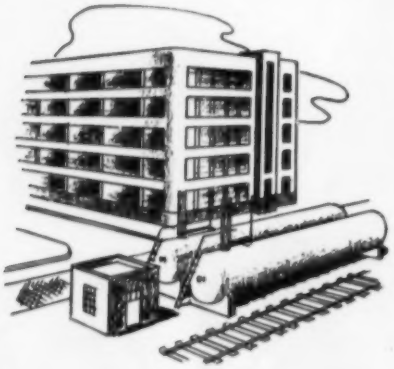
Mayari R *makes it lighter... stronger... longer lasting*

Phillips 66

Philgas*

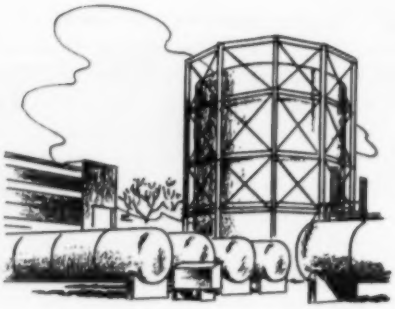
THE ALL-PURPOSE FUEL

For Industries



Philgas, a clean, high-quality LP-Gas, is being used by leading industries for heat treating, mold drying, core baking, ceramic firing and many other operations. Philgas butane-propane systems are automatic, cutting down on overhead while assuring constant furnace temperatures, atmospheres, and pressures.

For Utilities



Free from harmful contaminants, Philgas is used by many progressive utilities to augment supplies of natural or manufactured gas. Cleanliness, uniformity, constant pressures (high or low) and easy automatic operation make Philgas a *superior* product. It's America's largest selling brand of LP-Gas.

*Phillips *66* and Philgas are the Phillips Petroleum Company trademarks for its high quality propane-butane LP-Gas or bottled gas.

PHILLIPS PETROLEUM COMPANY

Sales Department **Bartlesville, Oklahoma**

Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Pontiac, Mich., Indianapolis, Ind., Kansas City, Mo., Milwaukee, Wis., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tulsa, Okla., Wichita, Kan.

Try...Compare...the New HOBART Arc Welders

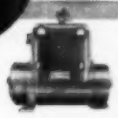
HOBART WELDERS, ELECTRODES

300 amp. electric portable

. . . and you'll see why you get more actual benefits in dollar savings and INCREASED PROFITS! HOBART'S outstanding design and special features bring **higher performance, faster welding and lower cost operation** in a compact and easy to move unit.

200 amp. air cooled gas drive

For Plant Production and Maintenance



For Automatic Welding

Bantam Champ

AC Transformer Welders

ELECTRIC MOTOR DRIVEN. Production, maintenance and general shop welding can be done faster and better than you ever thought possible. Made for light work or heavy in 200, 300, 400 and 600 ampere sizes—either stationary or portable.

If you are not using Hobart, you'll want to investigate these money-saving, profit-making welders. An investigation costs you nothing. Find out how you can get better, lower cost welding. Just mail coupon for complete details.

300 amp. Gas Engine Drive

For Construction Building and Repair

AC Welder AC Power Combination

250 Ampere "Pipeliner"

GAS ENGINE DRIVEN Hobart offers a wide range of models and sizes to meet every welding requirement . . . available with air or water engines.

Now you can have AC welding and AC power for jobs away from power lines or as emergency power for electric lights . . . to operate power tools, motors, etc. Use coupon for complete information without obligation.

HOBART Electrodes, too are best by Comparison

Try them. Comparison will prove you can get more top quality welding per day. Hobart electrodes are made for every application of A.C. or D.C. welding. Tell us the type work you do and we'll send samples for you to try!

HOBART TROY OHIO WELDERS

made by HOBART, one of the world's largest builders of arc welders and welding equipment.

Hobart Brothers Co., Troy, Ohio, Phone 21223

☐ FREE Welder's Vest Pocket Guide . . . a practical guide to better Welding techniques.

HOBART BROTHERS COMPANY, BOX ST541, TROY, OHIO

Send information on the items checked below.

_____amp. Capacity ☐ Portable ☐ Stationary ☐ Electric Motor Driven Welders ☐ Gas Engine Driven Welders ☐ Free Electrode Samples—state type work _____

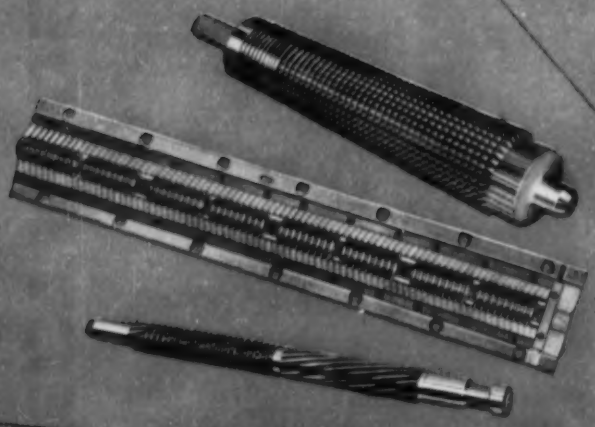
☐ Other _____

NAME _____ POSITION _____

FIRM _____

ADDRESS _____

BROACHES



GROUND MULTIPLE THREAD MILLING CUTTERS

FORM-RELIEVED MILLING CUTTERS

"Production-Proved" CUTTING TOOLS BY Continental

The cutting tools supplied to industry by Continental are *Production-Proved Tools*. Here's why:

Continental is an Ex-Cell-O subsidiary. As such, it can try out new tool designs, new methods, in Ex-Cell-O's big parts production shops. There could be no finer "proving ground."

Thus, Continental offers *Production-Proved Cutting Tools*. They are time-and-cost savers.

Call in your Ex-Cell-O representative or contact Continental in Detroit today for information about them.

FACE MILLS

CONTINENTAL DRIVE TOOLS

CONTINENTAL TOOL WORKS

Division of Ex-Cell-O Corporation, Detroit 32, Mich.

CTW

SINGLE POINT TOOLS

FORM TOOLS

53-47

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 22 May 31, 1954

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XLO

Standard Precision Boring Machines

Way-type Precision Boring Machines

Precision Cylinder Boring Machines

Vertical Precision Boring Machines

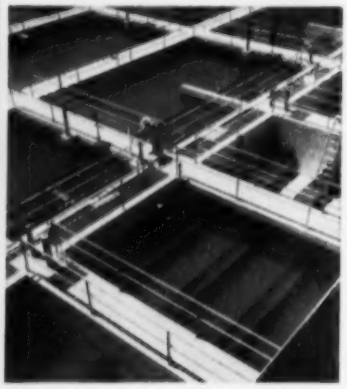
EX-CELL-O

(Advertisement)

what's NEW in Engineering

A new type of glass lathe is said to handle specialized glass work in labs and some production operations. It can be used to make ring seals, flanges, closures, glass fusings. A novel sleeve grip chuck allows quick set-ups of practically all forms of glass work without elaborate accessories.

How to quench a city's thirst. Faced with the future problem of serving 100,000 people, the City of Vallejo, California, engaged Kaiser Engineers to design and direct construction of a water system that would supply 21,000,000 gallons per day to the city. This



$6,000,000 project included 36 miles of pipeline, pumping and treatment plants, reservoirs and a distribution system. Reprints of this story are available upon request.

Relaxation Methods by D. N. de G. Allen, recently published by McGraw-Hill, explains how to use the Relaxation Method to solve various mathematical problems which arise in engineering science and applied physics. It covers in detail such recent advances as three-dimensional relaxation.

Kaiser Engineers has a large staff of engineering and construction experts ready to tackle your problems in all fields of design, engineering and construction. Call or write: Kaiser Engineers, Division of Henry J. Kaiser Company, Kaiser Building, Oakland 12, California.

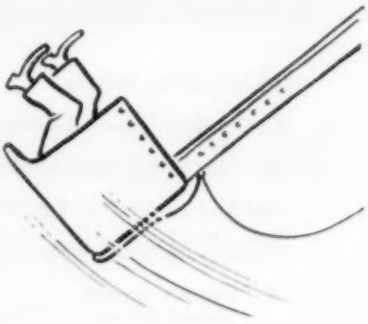
behind the scenes

Sweet Revenge

When we get mad we droodle. Many an unsuspecting victim has found himself the victim of our revengeful pencil.

Take our editors, for example. Got mad at one of them the other day when he blue-pencilled a particularly beautiful exclamation point we felt gave spectacular emphasis to our copy.

In our moment of madness, we droodled these impressions of the stalwart gentlemen of the Fourth Estate:



An editor who has been scooped.

Editor covering an assignment.

The deadline editors are always rushing to meet, unfortunately never make.

The editor who missed the point.

Now that we have vented our anger, we feel much relieved. Fact is, we feel good enough to get mad at the sales department. So be with us next week when we sharpen our pencils and drive home the point.

Incidentally, if you're in a droodling mood, please join in the fun. Perhaps we can publish your handiwork in one of our future columns. If we're still writing it, that is.

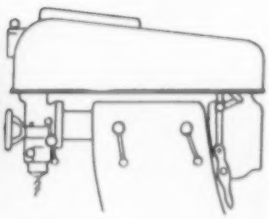
Shrdlu

(Metalworking Outlook—Page 39)

NEWEST OF THE U. S.-BURKE SUPER-VALUE MACHINE TOOLS

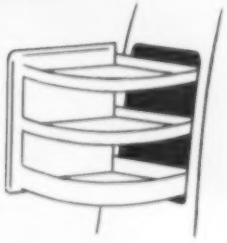
THE ECONOMICAL ANSWER TO ACCURATE, VERSATILE VERTICAL and ANGULAR MILLING

"U. S." VERTICAL Milling Machine



Balancing of head and motor and very substantial column provide increased rigidity and accuracy.

Another feature is the built-in spot light which assures maximum visibility at most vital points.



Swing-out shelves handily house tools right in the column of the machine.

Thoroughly tested on the job by many of America's foremost manufacturers.

Created by America's foremost producers of small milling machines, to fill the big need for a balanced-head vertical miller that provides greater capacity and flexibility than is normally associated with machines of its type.

The new U. S. Vertical ideally combines most advanced engineering, experience of practical machinists and modern design without sacrifice of basic characteristic "U. S." simplicity.

COSTS SURPRISINGLY LITTLE

Quickly pays for itself by simplifying or taking over vertical milling and boring jobs which often tie up far more costly standard machines.

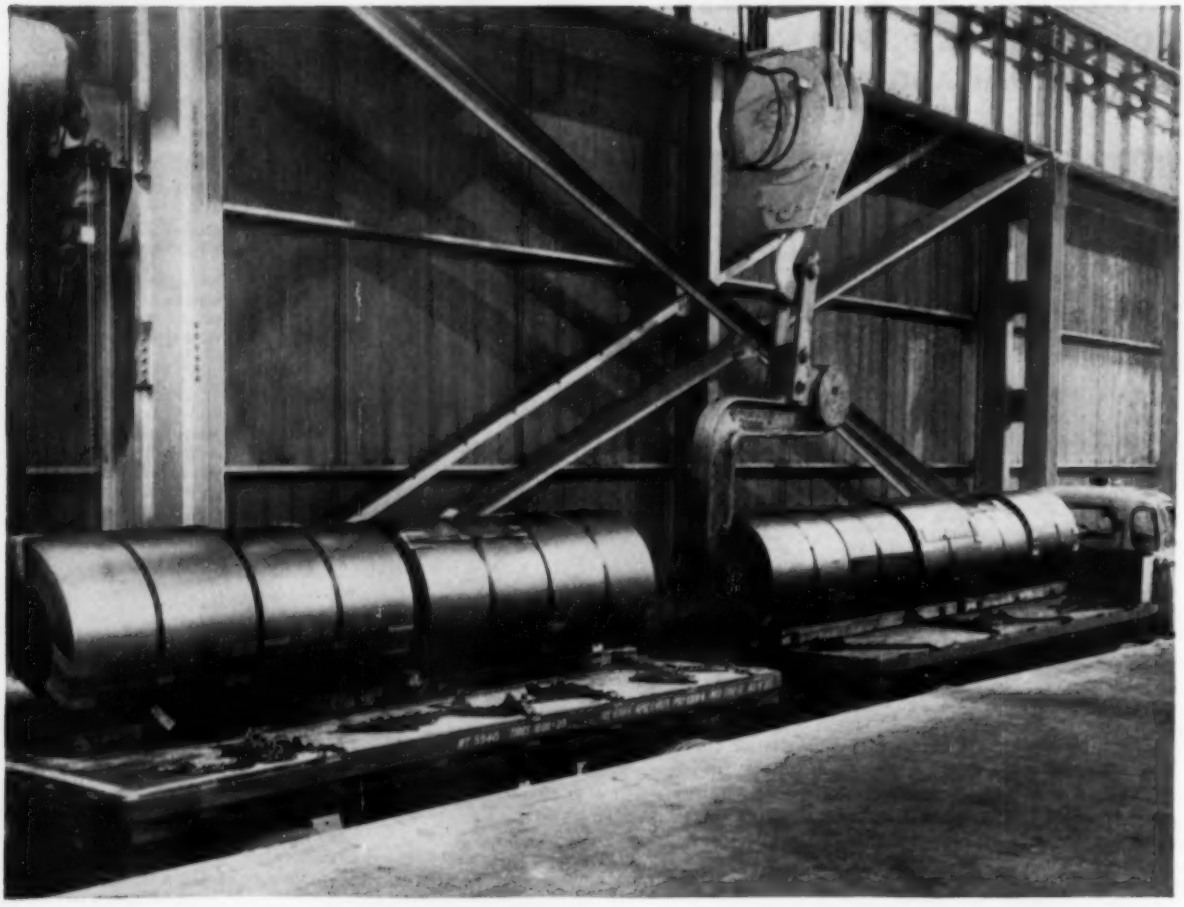
SEND FOR COMPLETE DETAILS

Illustrated literature which describes complete specifications, capacities, exclusive features and advantages gladly furnished on request.

U. S. BURKE
MACHINE TOOL DIV.

Brotherton Road 10, Cincinnati 27, Ohio

Ready to supply your requirements for Cold Rolled Sheets and Strip



First commercial shipment of cold-reduced sheets ready to leave the mill—January, 1954.

Cold rolled sheets and strip are being shipped from the new mill at our Indiana Harbor Works at East Chicago, Indiana. This new cold rolled sheet mill, with a monthly capacity of 40,000 tons, is a major unit in an integrated program of additions and improvements.

We are ready to supply your requirements for cold rolled sheets and strip. For further information, write or phone our nearest District Sales Office.

Youngstown

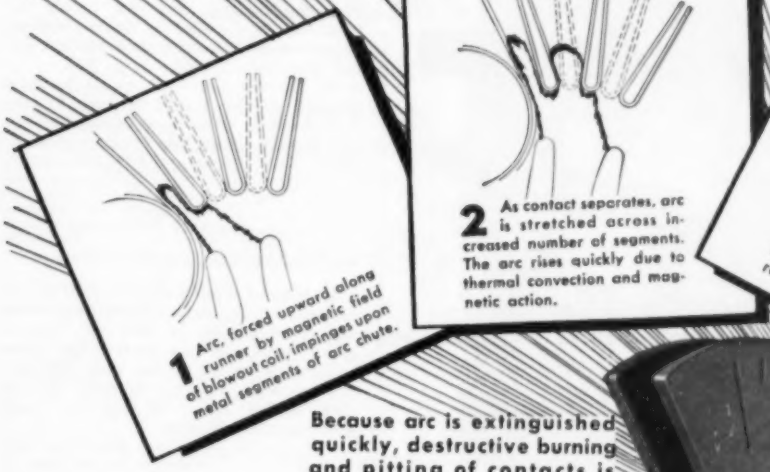
QUALITY · YOUNGSTOWN · SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - District Sales Offices in Principal Cities

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

Quick Quenching
EXTENDS CONTACT LIFE!

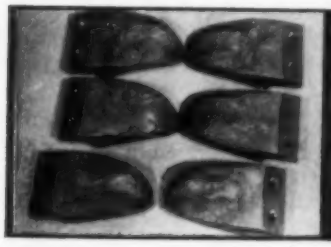

1 Arc, forced upward along runner by magnetic field of blowout coil, impinges upon metal segments of arc chute.
2 As contact separates, arc is stretched across increased number of segments. The arc rises quickly due to thermal convection and magnetic action.
3 Resistance in arc path increases as number of gaps increase. Metal elements help cool path while arc races to extinction.

Because arc is extinguished quickly, destructive burning and pitting of contacts is minimized.

CONTACT BURNING is the most troublesome and costly maintenance factor in an interrupting device subjected to repeated overloads. In the Allis-Chalmers Type 260 contactor a quick-quenching arc centering blowout solves the problem by sharply curtailing arcing time.

No Contact Erosion After Punishing Tests

Pictured below are contacts removed from a 600-amp experimental starter after extreme overload tests. In addition to great number of interruptions at rated current and below, these tests included 70 interruptions spread between 700 and 11,000 amperes and two interruptions above 13,000 amperes. All testing was done with the same set of contacts. A-4334



CONTACTS AFTER HIGH INTERRUPTION TESTS

ALLIS-CHALMERS Mill Type 260 DC CONTACTOR

For complete information on heavy duty dc contactors, call your nearby Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Write for booklet,
"How To Specify Corrugated Boxes."
Hinde & Dauch, Sandusky 47, Ohio

HINDE & DAUCH

Authority on Packaging

17 FACTORIES AND MILLS • 40 SALES OFFICES

LETTERS
TO THE EDITORS

Exposing Apprentice Problem

A. C. Beaubien, chief of the Standards Review Branch, as well as Ansel Cleary, assistant director of the Bureau of Apprenticeship, and others are very enthusiastic over your excellent presentation of the need to expand apprentice training, and the highly interesting data contained in the article, "Apprentices: Assurance of Skilled Labor Tomorrow" (May 3, p. 65).

We would like very much to have reprints of the article for use by our field staff in promoting apprenticeship. We would appreciate a quotation on 5000; 7000; 10,000; and 20,000 copies.

Reginald Perry
information representative
Bureau of Apprenticeship
U. S. Department of Labor
Washington

• *Quotation has been sent.—ED.*

In reading over and over your article on apprentices, we could not help thinking how true it is that the boss is greatly interested in getting the finest equipment to use in his shop but does not greatly interest himself in the fine skilled labor he can get from schools such as ours.

We would like very much to have 15 copies of this article by William E. Dean and to congratulate him on this timely story.

Leon Lesage
chief foundry instructor
Ecole Technique des Trois-Rivieres
Trois-Rivieres, Que.

Seeks the Finishing Touch

We read with interest your Technical Outlook item on electropolished forgings (May 3, p. 95). Could you tell us where we can find out more about electropolishing? We make small, precision parts and may be interested in installing electropolishing here.

Dr. Erwin J. Saxl, president
Tensitron Inc.
Harvard, Mass.

• *Write to the Society of Automotive Engineers, 29 W. 39th St., New York 18.—ED.*

Productivity in the Office

We thought your article, "Office Automation: New Frontier To Cut Costs" (May 17, p. 59), was very interesting and would appreciate receiving five copies.

Dean A. Kearsh
Remington Rand Inc.
New York

• *Being sent.—ED.*

Baffling Blunder Boards

Our management group is interested in becoming more intimately acquainted with the advantages and disadvantages of installing blunder boards in our plants.

We imagine the term "blunder board" has about the same meaning to every-

(Please turn to page 12)

Here's how you save

WITH THE

DU PONT SODIUM HYDRIDE DESCALING PROCESS

1. SHORT TIME CYCLE

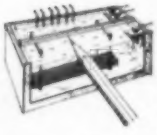
Only 15 seconds are required to get cold reduced-annealed strip clean and bright—10 to 20 minutes for fabricated articles, sheets, wire, rods, bars and forgings. Even heavily scaled forgings ($\frac{1}{2}$" scale thickness) take less than an hour!

2. NO LOSS OF BASE METAL

There's no danger of costly rejects due to pitting, etching, or loss of gauge with the Du Pont process—no matter how long work is left in the bath. This permits working to closer tolerances and assures high dimensional accuracy.

3. RETREATMENTS RARELY NEEDED

One pass through the sodium hydride bath will do the job completely. You can maintain uniform speed in production-line descaling. Quick completion of orders means you can substantially cut down on inventory in process.



4. SIMPLIFIED PROCESS

No scale-breaking or special racking procedures are required. Finished stock of any size or shape can be completely descaled with the versatile Du Pont process. Even dissimilar metals can be treated in the same bath—at the same time!

5. EASY TO OPERATE

Any pickler can be trained in a few hours to run the Du Pont Sodium Hydride Descaling Process effectively. You can do more work with fewer men and less equipment. And you save on time, space and labor costs.

6. DU PONT TECHNICAL SERVICE

If you are descaling metals which are unaffected by fused caustic at 700°F., it will be to your advantage to talk with us about the Du Pont Sodium Hydride Process. Du Pont pioneered this modern descaling method and can bring a depth of technical experience to bear on your descaling problems. There's no cost for this service which includes laboratory investigation of problems plus expert aid in the construction, installation and operation of the process. Just call our nearest district office or send in the coupon below.

SEND FOR FREE BOOKLET describing the Du Pont Sodium Hydride Descaling Process—how it works—what it can do for you. This illustrated booklet lists the metals that can be descaled with this remarkably efficient process . . . gives brief descriptions of necessary equipment and operating precautions. Just fill out and mail the coupon below for your copy. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

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DU PONT
Sodium hydride process for positive descaling

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Wilmington 98, Delaware

☐ Please send me your free booklet on Sodium Hydride Descaling.

☐ Please have one of your technical men call. I am interested in descaling _____.

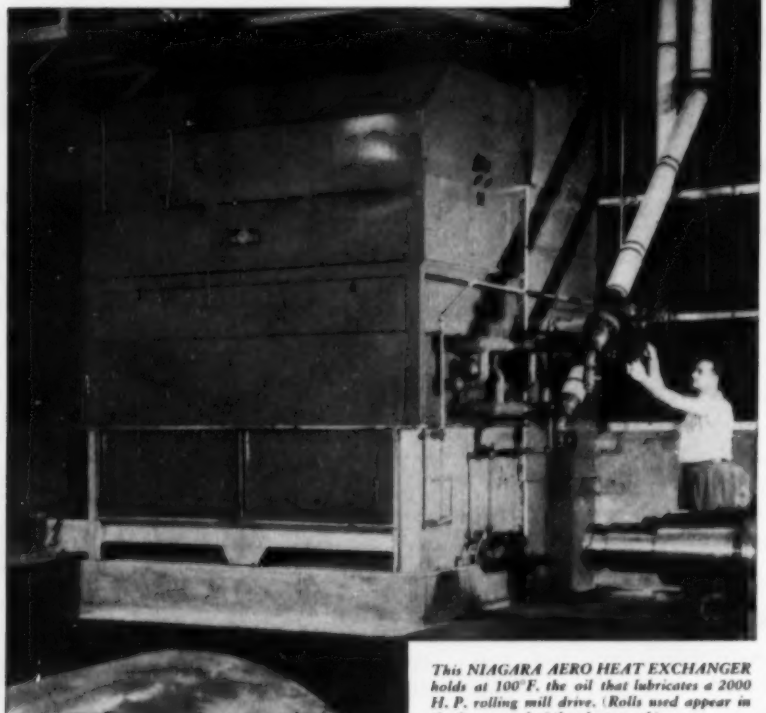
Name _____ *Position* _____

Firm _____

Address _____

City _____ *State* _____

YOU CAN KEEP ACCURATE CONTROL OF LUBE OIL TEMPERATURE



This NIAGARA AERO HEAT EXCHANGER holds at 100°F. the oil that lubricates a 2000 H. P. rolling mill drive. (Rolls used appear in the foreground of the photograph).

The Niagara Aero Heat Exchanger uses atmospheric air to cool liquids and gases by evaporative cooling, removing the heat at the rate of input, controlling temperatures precisely. You save 95% of the cost of cooling water. You get great saving in piping, pumping and power, quickly getting back the cost of the installation.

You can cool and hold accurately the temperature of all fluids, air and gases, water, oils, solutions, chemicals for processes and coolants for mechanical and electrical equipment. You can cool welding machines, hydraulic and extrusion presses, plastic molds, furnaces, controlled atmospheres, quench baths, obtaining better results with precise temperature. You obtain closed system cooling, free from dirt or scale.

For further information, write for Bulletin No. 120

NIAGARA BLOWER COMPANY

Dept. S , 405 Lexington Ave. New York 17, N. Y.

Niagara District Engineers in Principal Cities of United States and Canada

LETTERS

(Concluded from page 10)

body. We understand a blunder board to be a specially designed display board on which are mounted defective and imperfect products, tools that have been damaged in the manufacturing process, and other mistakes due largely to carelessness, improper instruction and similar causes.

Our information on this subject is quite limited. Can you tell us where we can obtain additional information along this line?

H. Max Walters
personnel director
McQuay-Norris Mfg. Co.
Connersville, Ind.

• *The blunder boards we have noticed vary so widely according to individual conditions that to generalize is difficult. We are printing this letter in hopes that readers will give you some of their experiences.—ED.*

Quick Call on Titanium

PLEASE FORWARD 10 TEAR SHEETS "HOW TO MACHINE TITANIUM" (May 3, p. 96).

Neil O. Hofmann
Nordberg Mfg. Co.
Milwaukee

• *Sent.—ED.*

Up-to-Date in Automation

We would appreciate receiving three tear sheets of the article, "Automation: How Far Should You Go?" (Apr. 12, p. 87).

P. R. Tokash
Kearny Works
Western Electric Co.
Kearny, N. J.

Metal Selector: Terrific!

Your Metal Selector (May 10 issue) is terrific. We feel our sales department can use this any number of times in the field in assisting our customers to make a wise choice of a particular commodity.

If they are available, we would appreciate your sending us 50 copies.

W. J. Goss
assistant sales manager
A. R. Purdy Co. Inc.
Lyndhurst, N. J.

Please send me five copies of the Metal Selector . . .

J. C. Meade
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American Brass Co.
Detroit

. . . we would like three copies.

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• *These requests have all been filled. However, our supply of Metal Selectors is being exhausted rapidly.—ED.*

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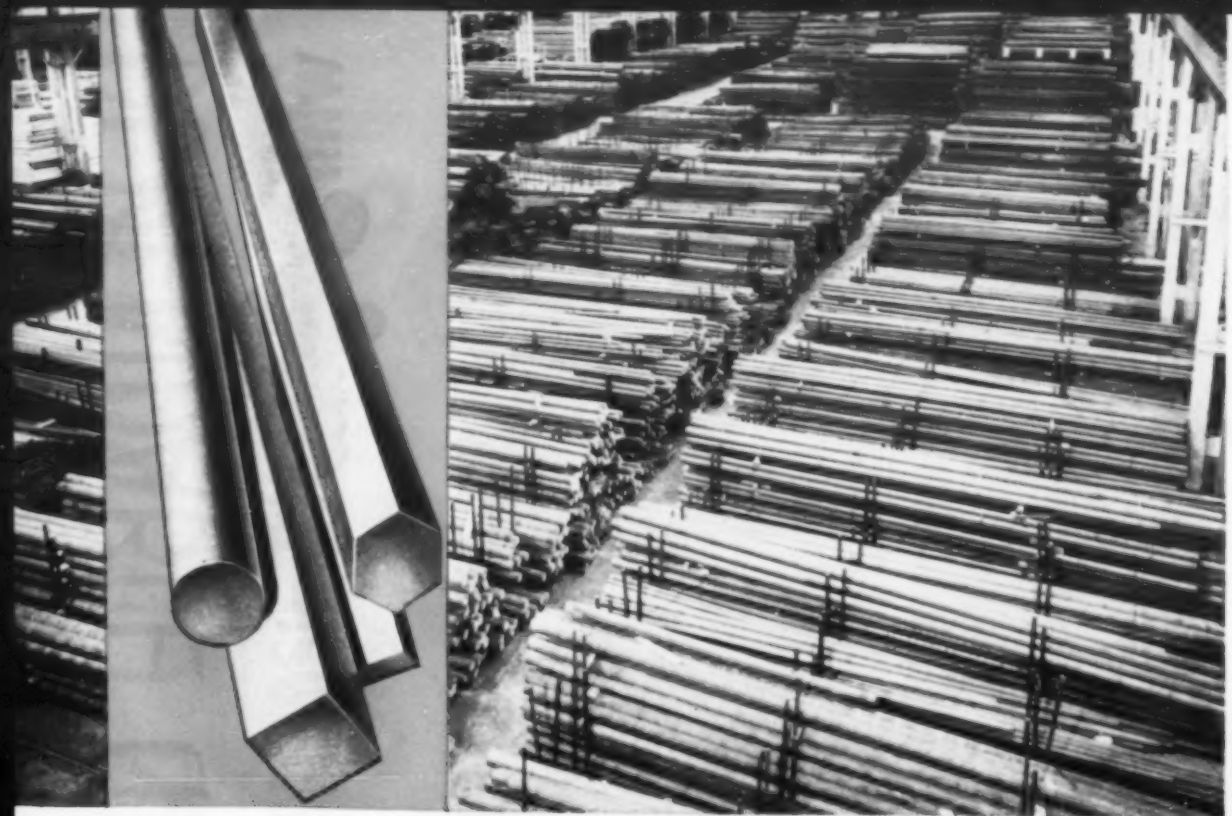

hot rolled
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carbon and alloy
stainless steel
brass and copper
aluminum . . .

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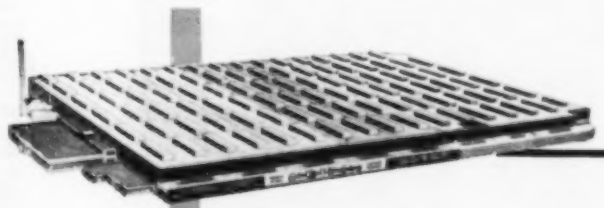

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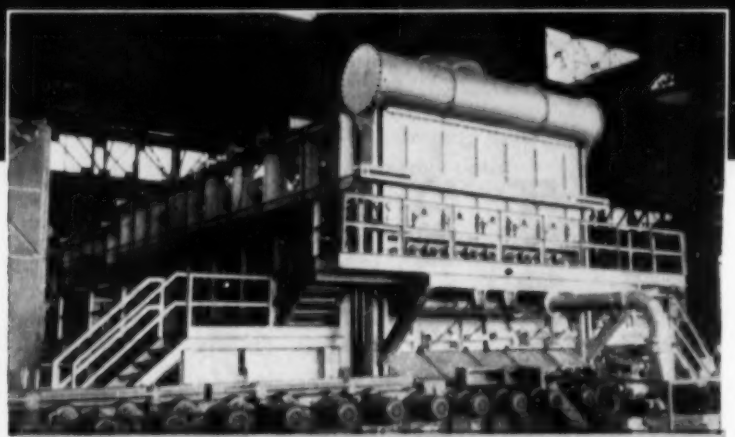
with Loftus Continuous Heating Furnaces



Another Loftus Continuous Heating Furnace recently installed in a Japanese Steel Plant. This furnace is used for heating steel slabs 4½" x 24" x 13' 6" to rolling temperature. *Slabs are heated from cold to 2360° F. in 1½ hours.* Furnace is equipped with two-zone top and bottom oil-fired burners. Two built-in recuperator cells of 5,000 square feet total heating surface preheat the combustion air. This furnace was designed to achieve the highest possible heat recovery due to excessively high fuel cost in Japan.

One of two Continuous Billet Heating Furnaces recently installed at Crucible Steel Company, Midland, Pennsylvania by Loftus. This furnace is used for heating carbon and alloy steels. Complete, modern automatic fuel, pressure and temperature controls are included.

(Photo Courtesy of Crucible Steel Company)

DESIGN and OPERATION...

for BLOOMS • SLABS • BILLETS • TUBE

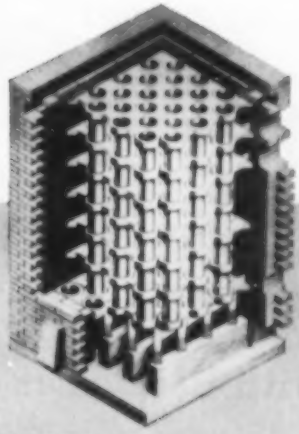
Long years of experience in design and construction of continuous heating furnaces coupled with practical innovations developed in recent installations give Loftus Continuous Furnaces dependable, trouble-free service, fitted to present day demands for lower cost production. Recognized for operating efficiency, ease of maintenance, and outstanding availability, Loftus furnaces provide low-cost, quality heating whether gas, oil, or combination fired. Large, efficient recuperators of either tile or metal tube design assure maximum heat recovery.

Fully automatic fuel, pressure and temperature controls provide correct fuel-air ratio at all times with minimum fuel consumption.

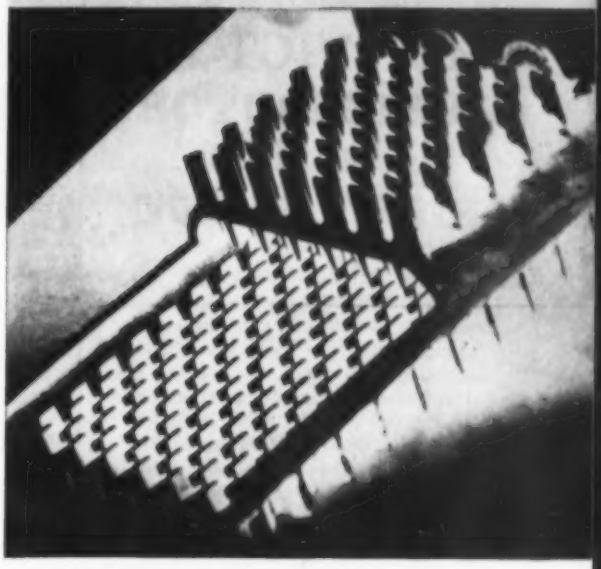
Throughout the world, Loftus engineers have designed and built one, two and three zone installations utilizing all types of fuel. You can rely on Loftus design and construction to give you the best quality heating at lowest possible cost.

A consultation with Loftus engineers can pay big dividends . . . Call or write—Today!

Oil and gas-fired melting, heating and heat-treating furnaces of every type and description for ferrous and non-ferrous materials producing and processing.



Cutaway section through vertical tube tile recuperator—made of materials tested and proven for many years to be best for this service.



Cutaway section through needle type metal recuperator tube. Made of specially developed heat resisting alloys, they may be furnished in either plain surface, needle surface, or finned surface tube types. (Note fins on both inner and outer surfaces of tube illustrated.)

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Designers and Builders of Industrial Furnaces

610 Smithfield Street, Pittsburgh 22, Pennsylvania

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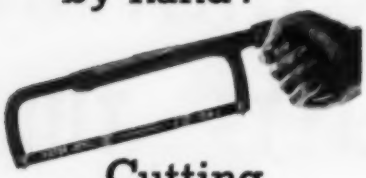

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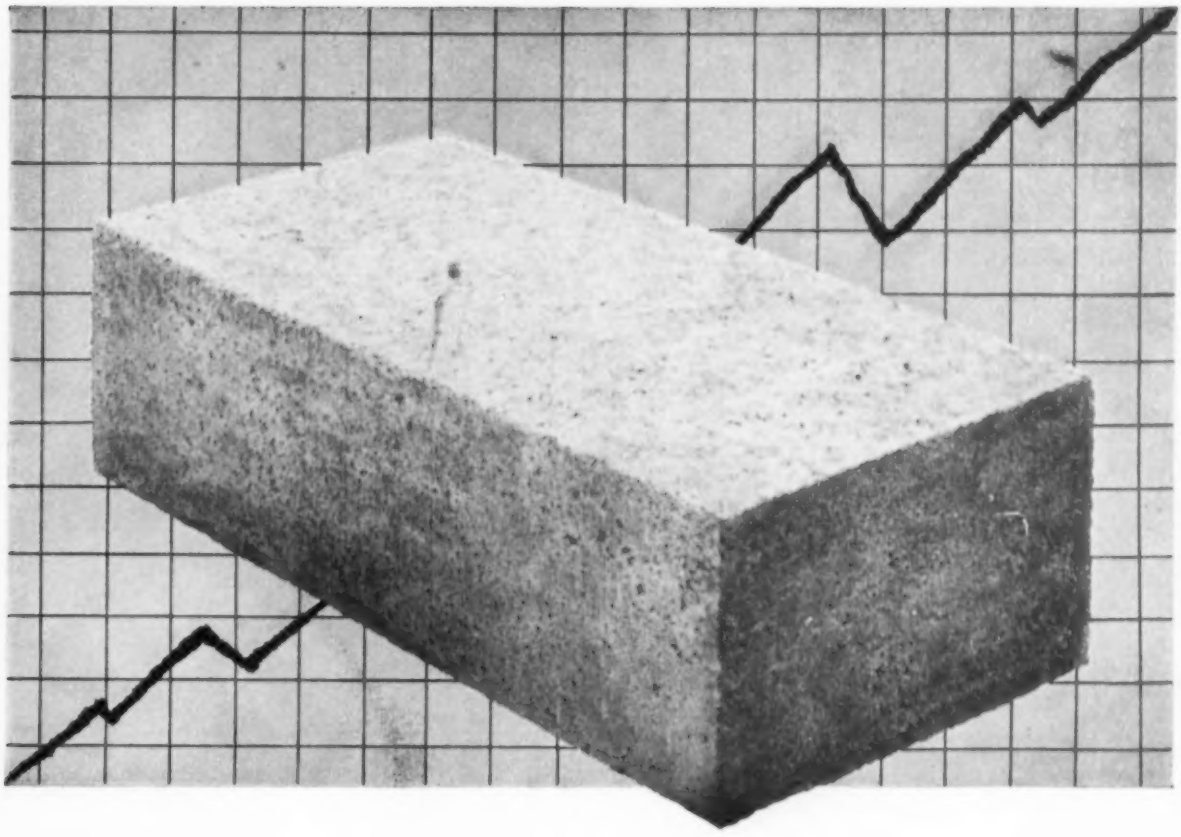

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Principal sales office: Chemical Division, Kaiser Aluminum & Chemical Sales, Inc., First National Tower, Akron 8, Ohio.

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CPA-B (Chrome-Periclase"A," burned) for open hearth front and back walls. Controlled chrome additives result in highest resistance to spalling.

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112

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A coke-oven battery inspection by Koppers is a thorough checkup by experienced field engineers, followed by review and evaluation by men who have been designing, building and repairing coke ovens for many years. It does not replace, but complements the regular inspections made by your battery foreman or boss heater.

Because a Koppers inspector is not distracted by the daily problems of coke-plant operation, he can give objective and concentrated attention to the job with which he is concerned—inspecting a coke oven. From close up he makes a detailed visual examination of the oven chamber, right after pushing —while the battery is in operation.

If the inspection shows that repair work is needed, Koppers is equipped to handle that, too. We make recommendations, where applicable, and are completely prepared to fulfill all of your requirements regarding repairs that will prolong the life of your coke plant. An inspection, however, in no way obligates you to have the work done by us. We would welcome the opportunity to discuss our inspection service with you.

Constructing and repairing coke ovens is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers.

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Engineering and Construction Division

KOPPERS COMPANY, INC., PITTSBURGH 19, PENNSYLVANIA

Inspector examining coke-oven chamber from the bench. In his book, he is making a careful record of all brick-work that should be repaired.

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By simply drawing the lock wire through a small hole in each nut or screw, and then twisting tightly with pliers, a positive sure cure for the "shakes" is provided.

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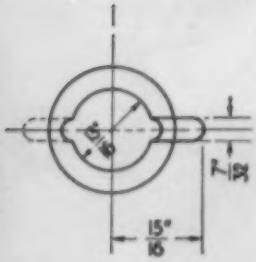
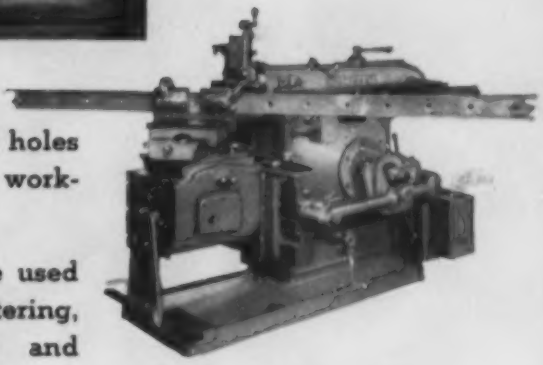


Photos courtesy The Ohio Knife Co., Cincinnati, Ohio.



This Cincinnati Shaper notches plow-bolt holes in these shear knives every five minutes, working two shifts, full time.

Shapers at The Ohio Knife Company are used strictly as manufacturing tools, for mitering, contour cutting, slotting, corrugating and beveling knife blades.

The setups for all these operations are simple, rapid and inexpensive—and a low manufacturing cost results.

Write for Shaper Catalog N-6.

Knives are high carbon, high chrome steel. Cutting tool is high-speed steel. Shaper operates at 119 strokes per minute.

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THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

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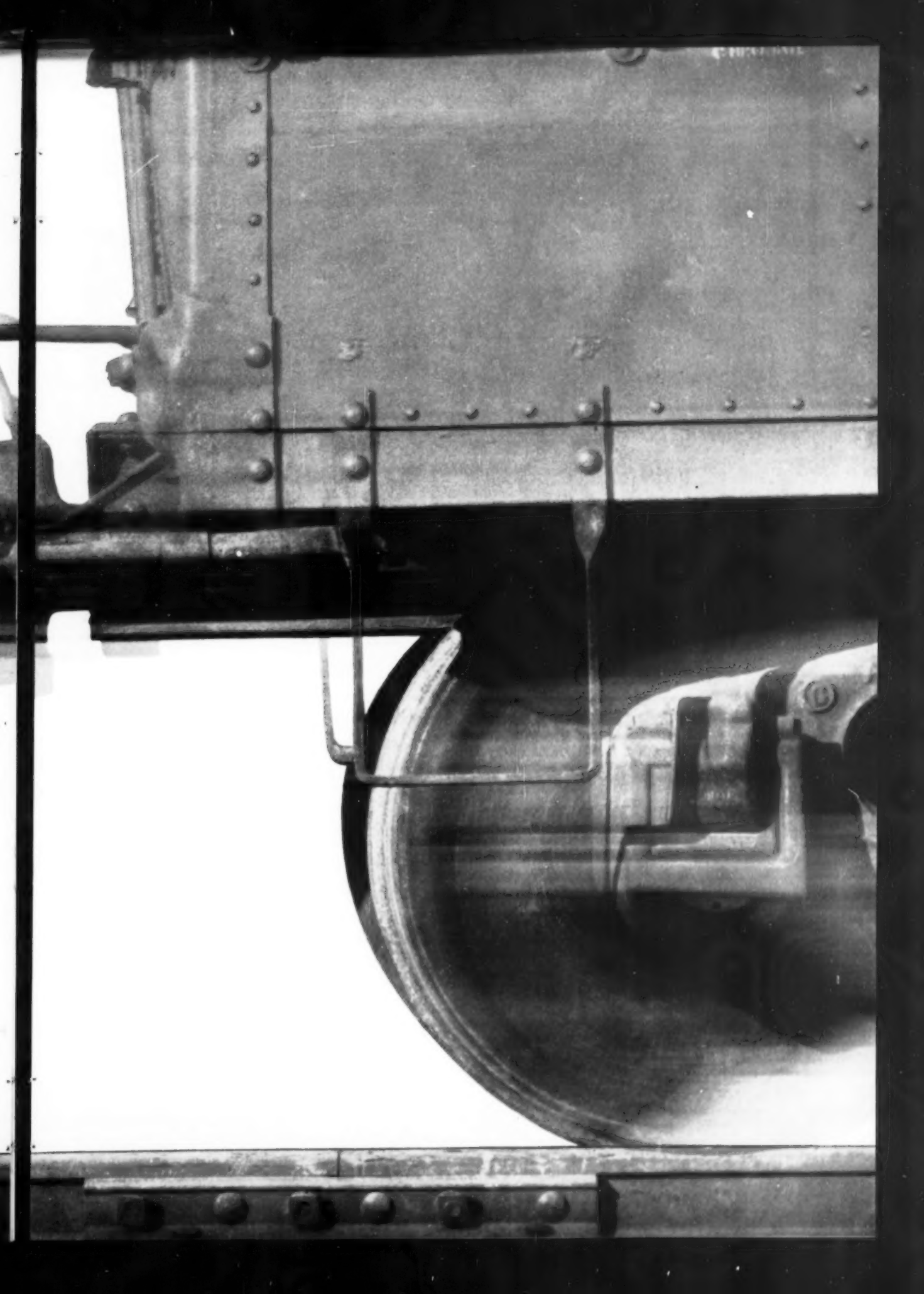

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CALENDAR
OF MEETINGS

May 31–June 11, Canadian International Trade Fair & National Air Show: Exhibition Park, Toronto, Canada. Director of the Trade Fair: Glen Bannerman.

June 3-5, Electric Metal Makers Guild Inc.: Annual meeting, Moraine-on-the-Lake, Highland Park, Ill. Guild address: Box 6026, Mt. Washington Sta., Pittsburgh, Pa. Secretary-treasurer: C. B. Williams.

June 6-9 American Gear Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: J. C. Sears.

June 6-11, Society of Automotive Engineers Inc.: Summer meeting, The Ambassador, Atlantic City, N. J. Society address: 29 W. 39th St., New York 18. Secretary and general manager: John A. C. Warner.

June 7-10, Society of the Plastics Industry Inc.: National plastics exposition, Public Auditorium, Cleveland. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

June 9-11, American Society for Quality Control: Annual convention and exhibit, Hotel Jefferson, St. Louis. Convention manager: Wade R. Weaver, Republic Steel Corp., Republic Bldg. Cleveland.

June 10, Aluminum Extruders Council: Meeting and technical conference, Barbizon Plaza hotel, New York. Information: Phillip Lemelman, executive secretary, 209 Washington St., Boston, Mass.

June 10-11, Magnesium Association: Mid-year meeting, Seigniory club, Montibello, Quebec, Canada. Association address: 122 E. 42nd St., New York. Assistant secretary: Martha I. Hansen.

June 13-16, American Boiler Manufacturers Association & Affiliated Industries: Annual meeting, The Homestead, Hot Springs, Va. Association address: 1571 W. 117th St., Cleveland 7. Secretary: A. C. Baker.

June 13-17, National Industrial Service Association Inc.: Annual meeting, Hotel Statler, Detroit. Association address: 818 Olive St., St. Louis. Information: Horace Barks.

June 13-17, National Association of Cost Accountants: International cost conference, Hotel Conrad Hilton, Chicago. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnerson.

June 13-18, American Society for Testing Materials: Annual meeting and exhibit, Hotels Sherman and Morrison, Chicago. Society address: 1916 Race St., Philadelphia 3. Executive secretary: Robert J. Painter.

June 14-15, Malleable Founders' Society: Annnual meeting, Seigniory Club, Montibello, Quebec, Canada. Society address: 1800 Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

June 14-17, American Society of Mechanical Engineers: Oil and gas power conference, Muehlebach hotel, Kansas City, Mo. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

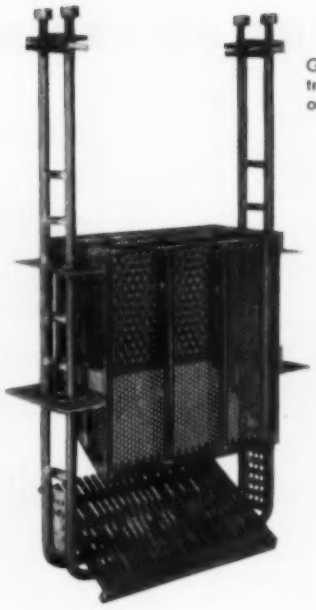
June 14-19, American Society of Civil Engineers: Spring meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society address: 33 W. 39th St., New York. Executive secretary: Col. William N. Carey.

June 15-17, Radio-Electronics-Television Manufacturers Association: Annual convention, Palmer House, Chicago. Association address: 777 14th St., NW, Washington 5. Secretary: James D. Secrest.

June 16-18, Committee on Vacuum Techniques: High vacuum symposium, Berkeley-Carteret hotel, Asbury Park, N. J. Committee address: Box 1282, Boston 9.

June 20-23, Aviation Distributors & Manufacturers Association: Mid-year meeting, Stanley hotel, Estes Park, Colo. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: H. Donald Richards.

June 20-24, American Society of Mechanical Engineers: Semi-annual meeting, William Penn hotel, Pittsburgh. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.



Gussett-built salt bath heat treating basket made of Inconel.

Gussett-built steam chest.

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In forty years of fabricating equipment for all segments of industry, Gussett has learned much about the requirements of all types of service.

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Your design prints, description or service requirement data is all we need to quote and put the job in production. If you desire, we'll send a representative fully qualified to help you work out the details involved. *May we figure on your next job?*

WRITE FOR THIS FILE BULLETIN with a complete listing of Gussett facilities and capabilities. You'll find it helpful in planning your fabricating jobs.

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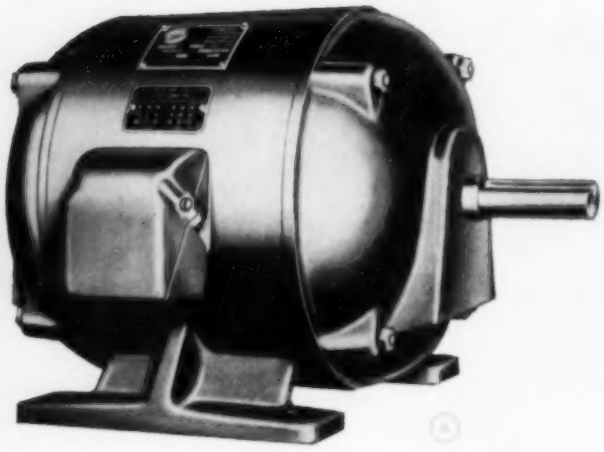

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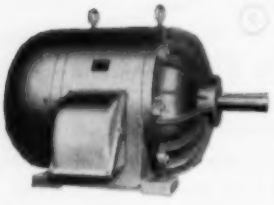
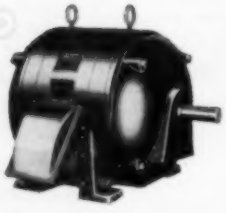
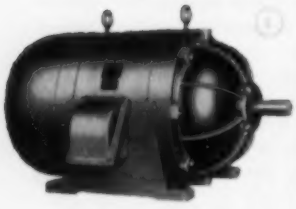
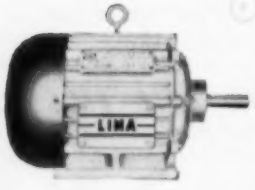








Lima Type RS, semi-enclosed, dripproof. Lima Type TE, totally enclosed, non-ventilated. NEMA frame sizes 66 to 254.

Lima Type RS, semi-enclosed, dripproof, NEMA frame sizes 5040 to 505.

Lima Type RE, totally enclosed, fan-cooled, NEMA frame sizes 5040 to 505.

Lima Type RS, semi-enclosed, dripproof, NEMA frame sizes 284 to 445.

Lima Type RE, totally enclosed, fan-cooled, NEMA frame sizes 364 to 445.

Lima Type E, totally enclosed, fan-cooled, NEMA frame sizes 224 to 326.

Lima Type EB, totally enclosed, fan-cooled, dust tight. U. L. Approved Class 2, Groups F & G, NEMA frame sizes 224 to 326.

Lima Type EX, totally enclosed, fan-cooled, explosion-proof. U.L. Approved Class 1, Group D, NEMA frame sizes 224 to 326.

Lima Shell-type motors and complete special motors, made-to-order.

1/3 to 150 Horsepower

For complete information...See your local Lima Representative listed in Thomas' Register, MacRae's Blue Book, Conover-Mast Purchasing Directory, or write—

THE LIMA ELECTRIC MOTOR COMPANY, 3588 Findlay Road, Lima, Ohio

LIMA ELECTRIC MOTORS

Representation throughout the U. S., Canada & abroad

FIRST . . . FOR MOTORS . . . DRIVES . . . GRINDERS

QUALITY

WEIRTON

cold-rolled strip steel

also available in

HIGH CARBON STRIP

N-A-X HIGH-TENSILE STRIP

ELECTROLYTIC ZINC COATED STRIP

The unvarying uniformity of Weirton quality is the result of superior equipment and complete control from mine to finished product. Expert metallurgists, chemists and engineers subject Weirton cold-rolled strip to hundreds of complex tests and checks to assure the high quality that simplifies production and lowers costs. The next time your plans call for cold-rolled strip steel—call Weirton!

WEIRTON STEEL COMPANY

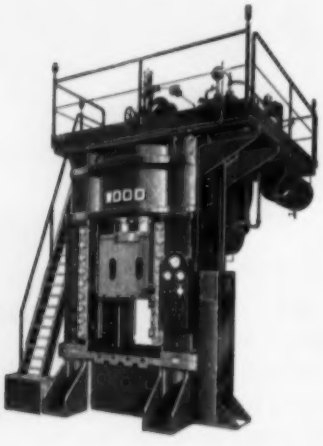
Weirton, West Virginia

NATIONAL STEEL CORPORATION

How do you feel about leaning ladders?

IN METALWORKING, THE PAYOFF'S AT AN R. D. WOOD PRESS LIKE THIS ONE!

This 2000-ton heavy duty, self-contained hydraulic forming press is used for continuous service on such operations as hot forging, forming, coining and forcing. R. D. Wood hydraulic presses are made in a full range of sizes and capacities, for many uses. Ask for catalog, and for engineering aid—both yours without obligation.



If you're human, it's likely that you've been tempted, at one time or another, to put superstition to the test. But—you probably decided *not* to walk under that ladder on the theory that it's better to let well enough alone. If you acted the same way in business . . . if you didn't feel compelled to know the always changing facts about production, markets, methods and all the rest . . . you'd have trouble in bunches. Take an hydraulic press, for instance. If your business uses presses, you ought to know something about them . . . how they can profit you. Find out about a Wood press—and be pleasantly surprised. You owe it to your stockholders. Ask for descriptive catalog.

R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

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MAKERS OF HYDRAULIC PRESSES AND VALVES

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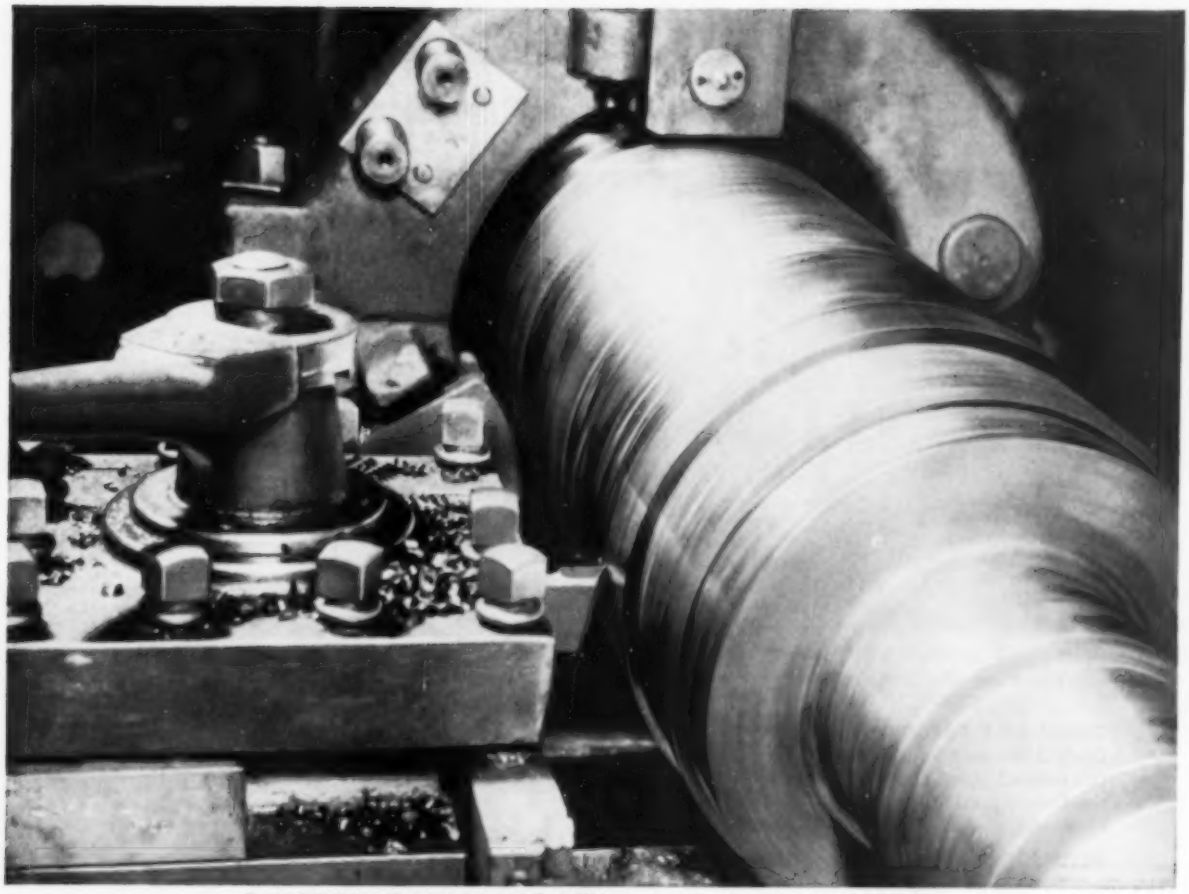


Turning AISI 1045 modified (hot-rolled) steel, Grade 350 increased tool life, cut downtime, lowered unit costs.

CARBOLOY ANNOUNCES NEW GRADE 350 CARBIDE FOR LIGHT ROUGHING, GENERAL FINISHING OF STEEL

On-the-job tests show that Grade 350 cuts faster, lasts longer than existing carbides; boosts production up to 30%

Carboloy® Grade 350—the second of the new Series 300 steel-cutting carbides—combines superior wear resistance and extreme toughness to an extent never before possible in the light roughing and general finishing range of steel machining. This has been proved on exhaustive on-the-job customer tests and applications (photos, operating data on following pages). Grade 350 is outperforming all existing carbides by up to 30% in this medium-duty range.

Built-in Tip Rigidity

A new, carefully controlled manufacturing process gives Grade 350 a unique grain structure and built-in structural rigidity. This rigidity enables Grade 350 to effectively resist the high temperatures (around 1800° F.) encountered during high-speed machining . . . conditions which cause the cutting edges of other carbides to deform.

Two Steel-Cutting Grades Now Available

Grade 370 for heavy-duty steel cutting, introduced late in 1953, was the first of the new Carboloy Series 300 carbides. Now Grade 350 extends the machining range of this new series to medium-duty steel cutting. Both grades are available immediately in a wide range of Standard Carboloy Tools and blanks.

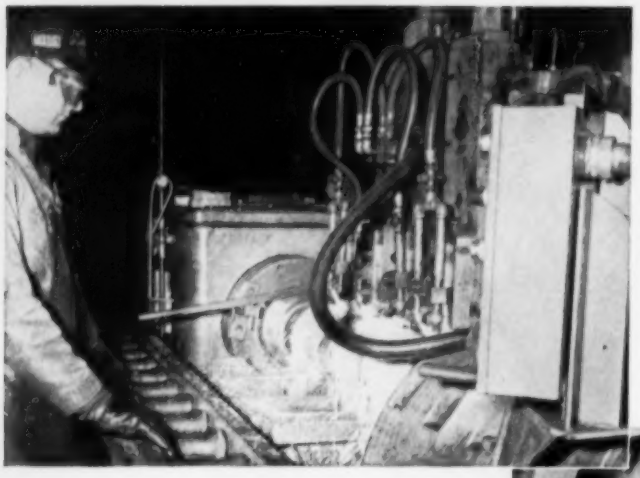
Typical in-plant case histories of these two new grades, with photos and operating data, are included on the following pages.

→

(Advertisement)

CARBOLOY GRADE 350 . . .

For light roughing and general finishing of steel

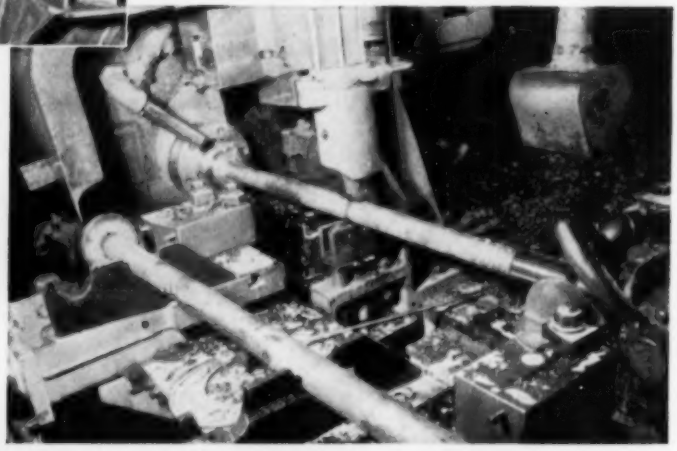


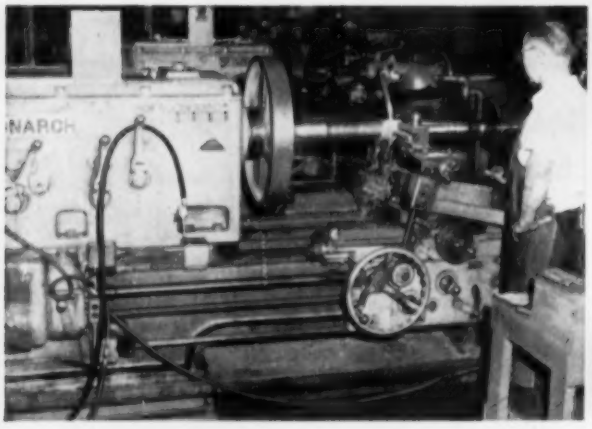
← **8-INCH STEEL SHELLS.** Grade 350 increased production runs on these forged and extruded shells between 15 and 20 pieces per grind. At toughest stage of rough-turning operation, Grade 350 processed 4 times as many shells as other carbides.

SETUP: Material—1045 steel with varying heat analysis. **Speed**—302 SFPM. **Feed**—0.044 inch. **Depth of cut**—1/16 to 3/16 inch. **Coolant**—No.

TRUCK AXLE FORGING. Turning with Grade 350 resulted in 33% more pieces per tool. Chipping and flaking, encountered with previously used tools, were eliminated. →

SETUP: Material—AISI 4150 steel forging. **Speed**—200 SFPM on 2-inch diameter; 400 SFPM on 4-inch diameter. **Feed**—0.014 inch. **Depth of cut**—1/16 to 1/8 inch. **Coolant**—Yes.





LANDING GEAR PISTON. Other carbides produced 2 parts per grind at 125 SFPM at Menasco Mfg. Co. Grade 350 increased speed to 185 SFPM. Production per grind went up 6 times; downtime was cut ½ hour per shift.

SETUP: Material—4340 heat-treated forged steel. **Speed**—185 SFPM. **Feed**—0.010 inch. **Depth of cut**—0.060 to 0.200 inch. **Coolant**—Yes.

ELECTRIC MOTOR SHAFT. Carboloy Grade 350 increased the number of linear inches cut by 30% over other carbides used for roughing and finishing this large steel motor shaft.

SETUP: Material—AISI 1045 modified (hot-rolled). **Speed**—300 SFPM. **Feed**—0.020 inch. **Depth of cut**—1/16 to 1/8 inch. **Coolant**—Yes.

(Advertisement)

CARBOLOY GRADE 370 . . .

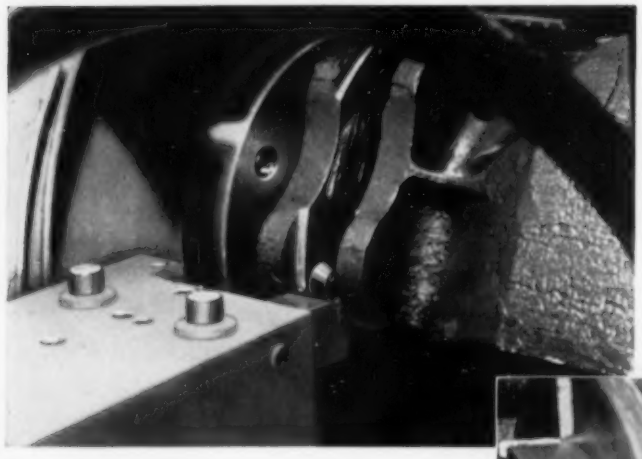
For heavy-duty steel cutting at higher speeds

JET ENGINE TURBINE WHEEL SHAFT. A single Grade 370 tool now handles roughing and finishing at General Electric's Lynn River Works. Formerly, two tools were needed. Though operating at around 1700° F., Grade 370 increased tool life at least 40%.

SETUP: Material—4340 steel with Brinell hardness from 269 to 321. **Speed**—200 SFPM. **Feed**—0.018 inch. **Depth of cut**—⅜ to ¾ inch.

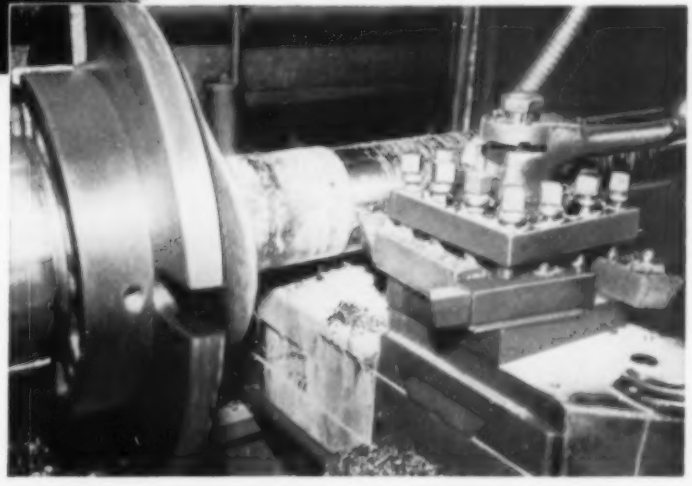
JET ENGINE TURBINE WHEEL RIMS. With Grade 370, G.E. got 300% increase in life of tools used for turning, boring and facing cold-worked Timken steel rims. Downtime was reduced two thirds and tool breakage drastically cut.

SETUP: Material—Cold-worked, forged Timken steel. **Speed**—160 SFPM on O.D.; 110 SFPM on I.D. **Feed**—0.010 inch. **Depth of cut**—½ to ⅞ inch. **Coolant**—Yes.



← **TRANSMISSION CASING** for fork lift truck. Machine downtime was sliced 50% and tool life extended almost 40% when Yale and Towne switched to Grade 370. Despite irregular steel casting, tool life on plunge facing operation increased 5 times with Grade 370.

SETUP: Material—Irregular cast steel with chilled spots and sand occlusions. **Speed**—318 SFPM. **Feed**—0.006 inch. **Depth of cut**—5/16 to ½ inch. **Coolant**—No.



DRIVE ROLLER SHAFT. Use of Carboloy Grade 370 on this heavily scaled forging reduced machining time 25% at Thew Shovel Co., Lorain, Ohio. Tool life was increased almost 50% and cratering encountered with other tools was eliminated.

SETUP: Material—AISI 1035 hot-rolled forging. **Speed**—336 SFPM.—**Feed**—0.025 inch. **Depth of cut**—½ inch.

Grades 350 and 370 now available in a wide range of standard tools and blanks

Many Standard Carboloy Tools are now tipped with Grades 350 and 370. In addition, blanks and inserts of each grade are available in several styles and in many sizes.

Your Authorized Carboloy Distributor now has complete stocks of tools and blanks to fill most of your requirements. Other styles and sizes are available nonstock.

For more information on medium-duty Grade 350 and heavy-duty Grade 370, and for price lists and specifications, send coupon, today.

For light roughing and general finishing of steel

GRADE 350

STOCK ITEMS

Blanks—6 styles, 40 sizes

Tools—5 styles, 20 sizes

Other styles and sizes available nonstock

For heavy-duty steel cutting

GRADE 370

STOCK ITEMS

Blanks—6 styles, 55 sizes

Tools—9 styles, 26 sizes

Other styles and sizes available nonstock

CARBIDES FOR ALL YOUR MACHINING

In today's competitive economy, carbides can cut your unit production costs on machining all materials—ferrous or nonferrous, metallic or nonmetallic.

Standard Carboloy Tools and blanks in other grades suited for your job are available. Contact your local Carboloy Authorized Distributor or salesman for tooling assistance. Send coupon, today, for free, new Brief-A-Log (GT-280) containing complete specifications and new lower prices!

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

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☐ Send Price List GT-300, containing specifications and prices on new Grades 350 and 370

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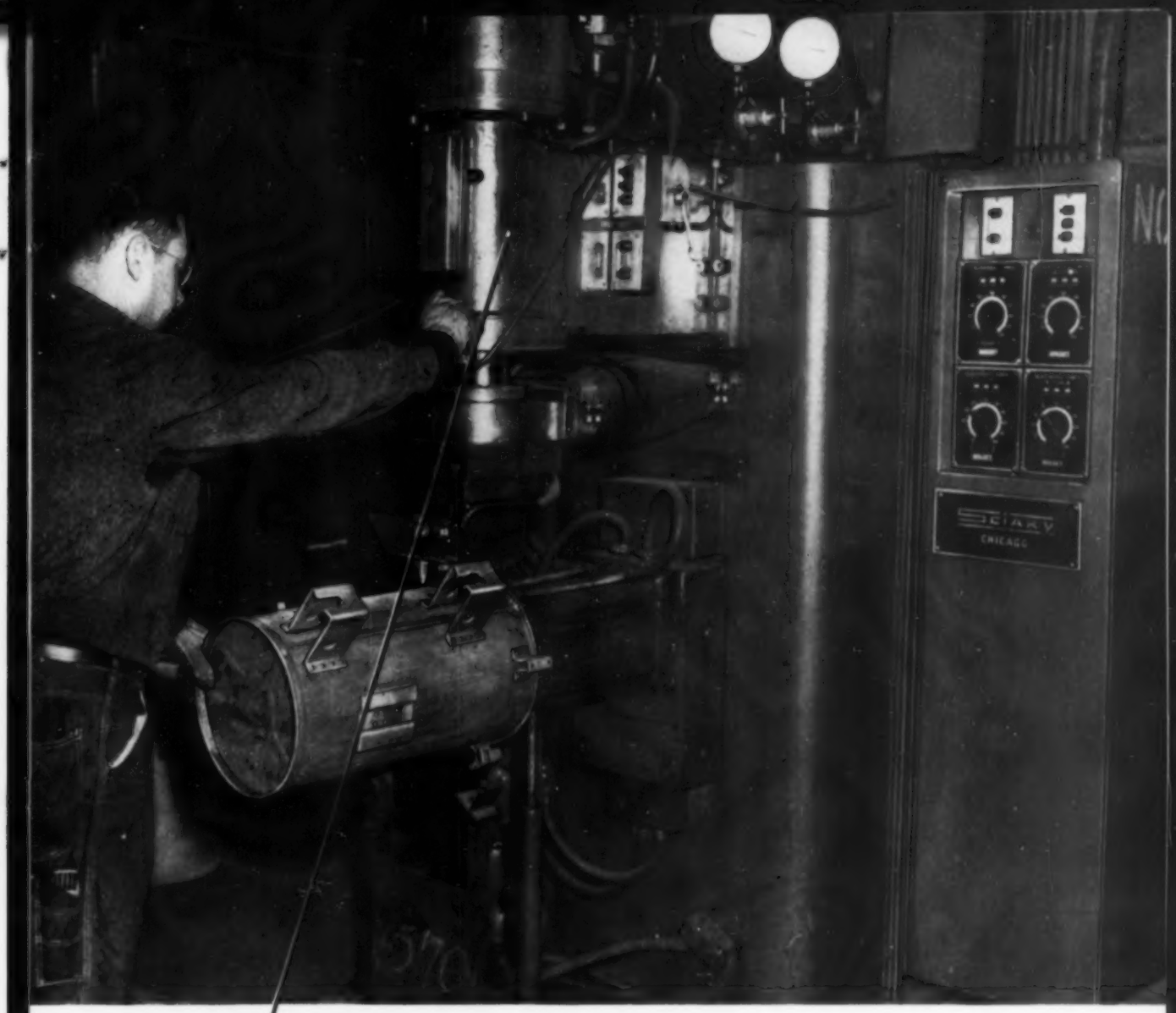
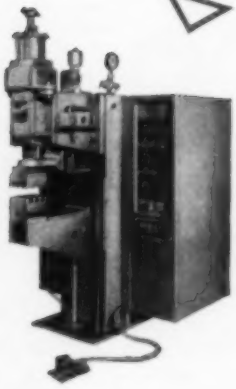
Name_____ Position_____

Company_____

Address_____

City_____ Zone_____ State_____





Resistance Welding Assembles up to 590 Transformer Tanks per Day

The Distribution Transformer Tank Department at Moloney Electric in St. Louis, Mo., uses a minimum number of Sciaky patented Three-Phase welders for a maximum number of operations.

In diameters of 10" to 30" and lengths of 21" to 54", the 12 and 14 gauge tank's side seam, flanged bottom, cooling fins, and as many as 12 internal and external fittings are resistance welded by only five Sciaky Three-Phase machines. No skilled workers are required to maintain consistency of operation necessary for inspection or production quota. Moloney records indicate no mentionable downtime during the last two years . . . For complete details on this unusually efficient resistance welding application, write for R.W.A.W. Vol. 3, No. 7.

The Resistance Welding Department at Moloney Electric is another fine example of Sciaky's basic thinking of welder design to do *more useful work* at *lowest operating cost* with *maximum reliability.*

Largest Manufacturers of Electric Resistance Welding Machines in the World

SCIAKY

4909 W. 67th Street, Chicago 38, Illinois

The BD is the preferred hub-type wheel for heavier stock removal. Ideal for smoothing and blending welds on fabricated work; smoothing flame-cut edges and stainless steel welds, cleaning between teeth of gear castings; many slotting, notching and cutting-off operations.

The BFR is outstanding for light snagging, light weld grinding, smooth finishing, blending contours and corners, removing mold marks, removing rust and scale, and scarfing and beveling before welding. Also for notching gates and risers.

4 Great Team-Mates for your "TOUCH of GOLD"

Norton REINFORCED WHEELS add value, cut costs on hundreds of grinding jobs

The BN is the recommended cut-off wheel wherever great strength and safety are vital. Excels at cutting-off non-ferrous gates and risers and various non-metals. Its range also includes cutting wire rope, slotting rails, tuck pointing, etc. Small sizes are popular on small portable grinders.

The BF, a straight wheel version of the BFR, is the wheel to use for light deburring, breaking edges on machined work, taking off flash from plastic parts, removing light welds and many other miscellaneous light portable and bench grinding applications.

BF Mounted Wheels and Points, like all Norton mounted wheels and points, are trued on their own spindles. Having the same laminated construction as the larger BF wheels, they are designed for such jobs as finishing plastic molds, glass molds, forging dies, etc. For hand finishing, use BF sticks.

Here's the Line-Up

BD Rigid hub-type, resinoid bonded. Glass cloth reinforcement for high strength plus the Nylon layer add up to extra hub-wheel safety. For the more severe jobs on your right angle grinders.

BFR Semi-flexible hub-type, resinoid bonded. Cotton fabric reinforcement with the additional layer of Nylon. For better finish and contour blending.

BF Semi-flexible straight wheel, resinoid bonded. Cotton fabric construction similar to the BFR but without Nylon reinforcement. For periphery grinding only. An excellent deburring and finishing wheel. Also available in mounted wheels and points and in hand sticks.

BN Straight wheel, resinoid bonded. Glass cloth reinforcement, as in the BD. Provides very high resistance to breakage in a wide range of cutting-off and other jobs.

Add outstanding versatility to strength and to safety, multiply the result by four and you have one reason why this Norton team rates as the "Big 4" among reinforced wheels.

Separately, each handles a considerable number of important grinding jobs. Together, they cover an almost endless list of applications, ranging from light deburring to severe cutting-off. And they do every one of these jobs with the *extra* safety, service life and economy that add the real "Touch of Gold" to your grinding operations.

Your Norton Distributor

will be glad to demonstrate Norton Reinforced Wheels in your shop, and to aid you in any grinding problem. Or write to NORTON COMPANY, Worcester 6, Mass. for the Brand New Catalog on Reinforced Wheels. Distributors in all principal cities, listed under "Grinding Wheels" in your classified phone directory. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Massachusetts. W-1553

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ABRASIVES
Making better products . . . to make other products better

Which package is best for you?

ROEBLING HIGH CARBON WIRE is packaged in many ways... and for every kind of usage there's one particular type of packaging that will bring top handling and production efficiency... new economy in your plant. For certain wires, Roebling's new large-size reels or new disposable spoolless cores have special money-saving advantages:

The large reels are ideal for long runs. They reduce down time to a minimum.

The new spoolless core (a hollow fibre core without flanges) abolishes the storing and return of empty spools ... eliminates charges for spools and waiting for credits.

You *pay* for the best when you buy high carbon wire. Make sure you *get* it in wire and packaging. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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Subsidiary of The Colorado Fuel and Iron Corporation

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PHOTO BY MC MANUS

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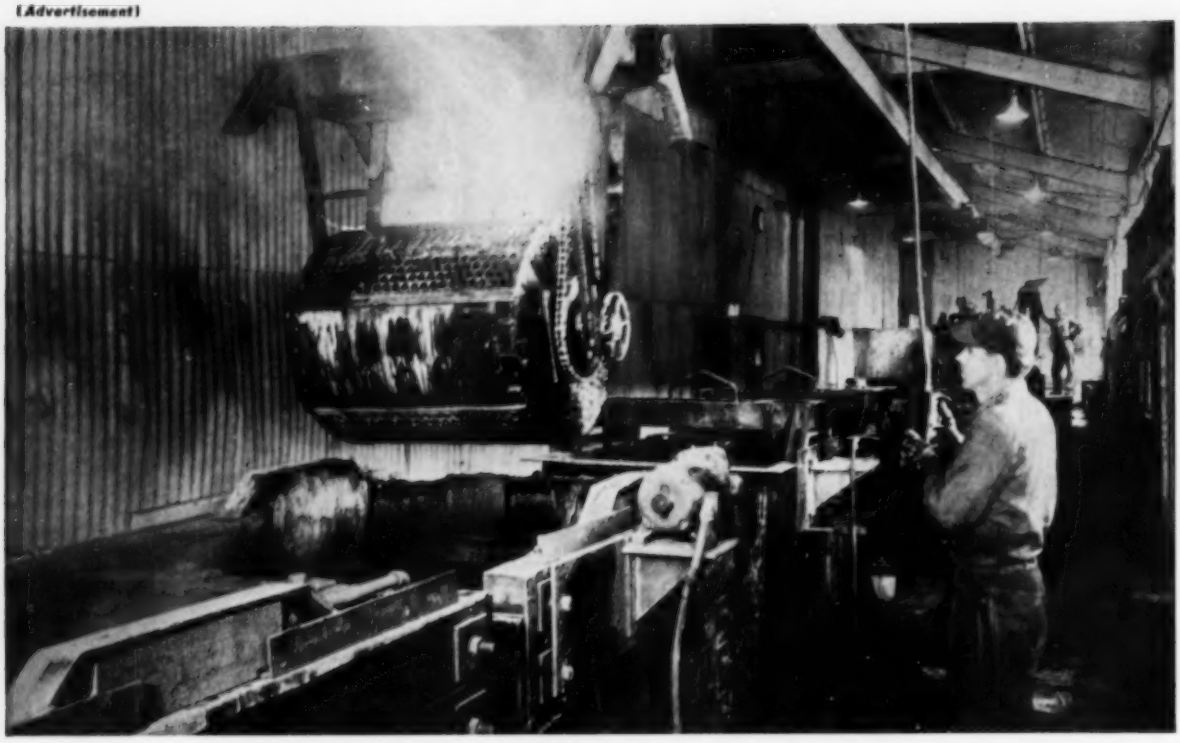

Lowering Monel drum into pickling bath — Bath is 12% sulfuric at 160°-180° F. Notice Monel tie bolts, nuts and square washers. Notice also line of tanks with drums immersed. Seven of the Monel drums service the line.

How Monel contributes to the efficient, reliable operation of . . .

Wheeling's New High Capacity Continuous Pickling System

Here's the equipment Wheeling Steel is using to degrease and pickle 6,000 pounds of couplings per hour at their Benwood, W. Va., mill.

It's a recent installation of unusual interest for its materials handling efficiency and for its built-in reliability of operation.

Monel® contributes to both features of the system. It's used for the perforated drums, the drum drive chains and the tie rods, nuts and large square washers that secure the tanks. In these parts, the corrosion resistance of Monel is essential . . . but there is more to it than that.

Take the Monel drums. They're chute loaded, then picked up, support and all, and passed successively through the baths and washes. At each tank, the gear on the support meshes with a motor-driven pinion when the drum is lowered to tumble the drum at 3 to 4 r.p.m.

You can see that not only corrosion, but severe mechanical shock, wear, and abrasion could shorten the life of both drum and chain. Monel stands up to the combined attacks with minimum loss of metal and no appreciable deformation.

Because of the past record of Monel in these respects, Youngstown Welding and Engineering Company, the designer and fabricator, was able to use relatively thin, lightweight sections and achieve a favorable payload-to-deadweight ratio. Thus, with Monel, less metal was needed and maximum materials handling efficiency obtained.

Couplings pouring into Monel drum — Notice frame above and supporting drum. Gear on support frame meshes with motor-driven pinion, positions drum opening to receive load.

In pickling equipment no metal has contributed more over the years to efficient, reliable operation than has Monel. You can use it with confidence, fabricate it with ease.

"5-Way Savings in Pickling" shows how Monel can solve many equipment problems in your pickling department. Send for this free booklet, now.

Monel Pickling Equipment INCO TRADE MARK

extra life • extra capacity • extra safety

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

Metalworking Outlook

The Labor Pot: At a Boil

Management and the union warm up for serious labor negotiations about the steel contract this week (p. 49). But already at a boil are parleys in another quarter. General Electric Co. offered its employees a 2.68-per-cent pay boost averaging 5 cents an hour, plus a better holiday plan. As of late last week, neither the independent electrical workers nor the CIO group had accepted or rejected the offer. The GE plan is not far from what the CIO electrical workers settled for with Radio Corp. of America—a 5-cent pay increase, 2 cents for fringes and 2 cents to "correct inequities" in some wage scales.

With the Fringe on Top

The trend on fringe-benefit costs continues to rise. The U.S. Chamber of Commerce says fringes cost an average of 16.9 per cent of manufacturers' payrolls in 1953. For nonmanufacturers, the average was even higher, 23.9 per cent. National Industrial Conference Board reports that a two-week vacation to employees costs you about 4 per cent of annual wages per man, while six holidays add another 2 per cent. An Associated Industries of Cleveland survey indicates that the average hourly expense of employee benefits to northeastern Ohio manufacturers was 30.8 cents last year, compared to 24.8 cents in 1951.

Controls—Just in Case

Washington planners are doing work on economic controls—just in case we get directly involved in Indo-China or some other "little" war. We already have the Defense Materials System which could be adapted readily for a Korean-type emergency. Depending on the severity of future developments, the administration also would be prepared to ask for wage, salary and price controls.

Collective Headache

Small Business Administration's biggest headache is the collective financial headache of small business. In February alone, 5000 representatives of little companies called on it to discuss their financial problems. SBA anticipated 230 loan applications a month but is getting 400. The agency has loaned $19 million to 324 firms in the last nine months, and estimates that its $55-million revolving fund to support that program will be exhausted in September.

Freer Trade Hits Snags

Don't look for many of the Randall Commission's recommendations to be translated into legislation by this Congress (p. 50). The President's foreign trade proposals, which follow the commission's ideas, are floundering on the Hill. For example, the administration wants a three-year exten-

sion of the Reciprocal Trade Act, which expires June 12, but will be lucky to get one year.

Investigators Eye Argentine Deal

The Senate Internal Security Subcommittee is quietly questioning government officials on sale of steel mill equipment to Argentina. But odds are high that the deal will go through without a hitch. A government-private Argentine combine bid $9 million for the equipment originally destined for Czechoslovakia but never shipped when that country went Communist. The new buyer, Sociedad Mixta Siderurgia Argentina, will use the equipment in a new plant being built near Buenos Aires.

Auto Independents: In Good Health?

Independent automakers are hardier than many people give them credit for. So says Edward G. Budd Jr., president of Budd Co. He believes the flexibility of the smaller firms may be their asset to assure survival and indicates that additional mergers may occur. He predicts that the last three years of this decade may see auto output reach 10 million units a year. He expects production of about 6 million cars and trucks in 1954.

GE Sees Equipment Boom

General Electric Co. sees these possibilities for 1964: About 66 million home television receivers, compared to 30 million now; 500,000 homes equipped with heat pumps (GE has just begun marketing the year-around air conditioner in the North); three times as many home freezers as now; twice as many electric water heaters; five times as many electric clothes driers; 11 times as many room air conditioners. In the next ten years as much electrical equipment will be built as has been produced in the last 75. And privately financed atomic power plants will be supplying part of the power needs by 1964.

Straws in the Wind

U.S. Steel Corp. is using 200,000 tons of Peruvian iron ore a month at its Fairless Works and southern plants; the procedure will probably be continued until its Venezuelan mines get into full production . . . Because of improved technology, Inland Steel Co. will have an annual ingot capacity of at least 5 million tons by next January, compared to 4.7 million tons now . . . American Car & Foundry Co. is the latest carbuilder to offer railroads a specially designed flat car for piggy-back traffic . . . An investigation of union welfare funds will be undertaken in June by a new House Labor subcommittee chairmanned by Rep. Samuel K. McConnell Jr. (Rep., Pa.).

This Week in Metalworking

Purchasing agents predict a strong economic finish for 1954 (p. 47) . . . To continue to serve the nation well in war and peace, the steel industry needs to operate on a more stable financial basis, speakers told delegates to the annual meeting of the American Iron & Steel Institute (p. 48) . . . Industrial movies are improving, both in lower costs and higher quality, as a tool for business (p. 52) . . . For the time being, civilian needs won't take anywhere near the 10 per cent of total titanium production recently freed for that purpose by the U.S. (p. 53) . . . Die casters foresee an upturn this fall (p. 57).

Would new shapes help keep your products ahead?

When your products go on the drawing board for redesign, it may pay you to keep in mind the many advantages of Armco Steel Tubing in special shapes. Tubing is pleasing to the eye. It may be the means of giving your products the extra sales appeal you want.

Chances are good we can supply this welded mechanical tubing in any shape you require. Getting tailored-to-order shapes can help you eliminate or greatly reduce many costly fabricating operations. They help step up production too.

Besides these shop savings, tubular parts give your products the most efficient section for light structural requirements under many types of loading conditions.

RANGE OF STEELS

Armco Tubing is supplied in hot-rolled steel, cold-rolled steel, and Armco ZINCGRIP (steel with a specially applied zinc coating). ALUMINIZED STEEL Tubing is made of a hot dip aluminum-coated steel that resists combinations of heat and corrosion.

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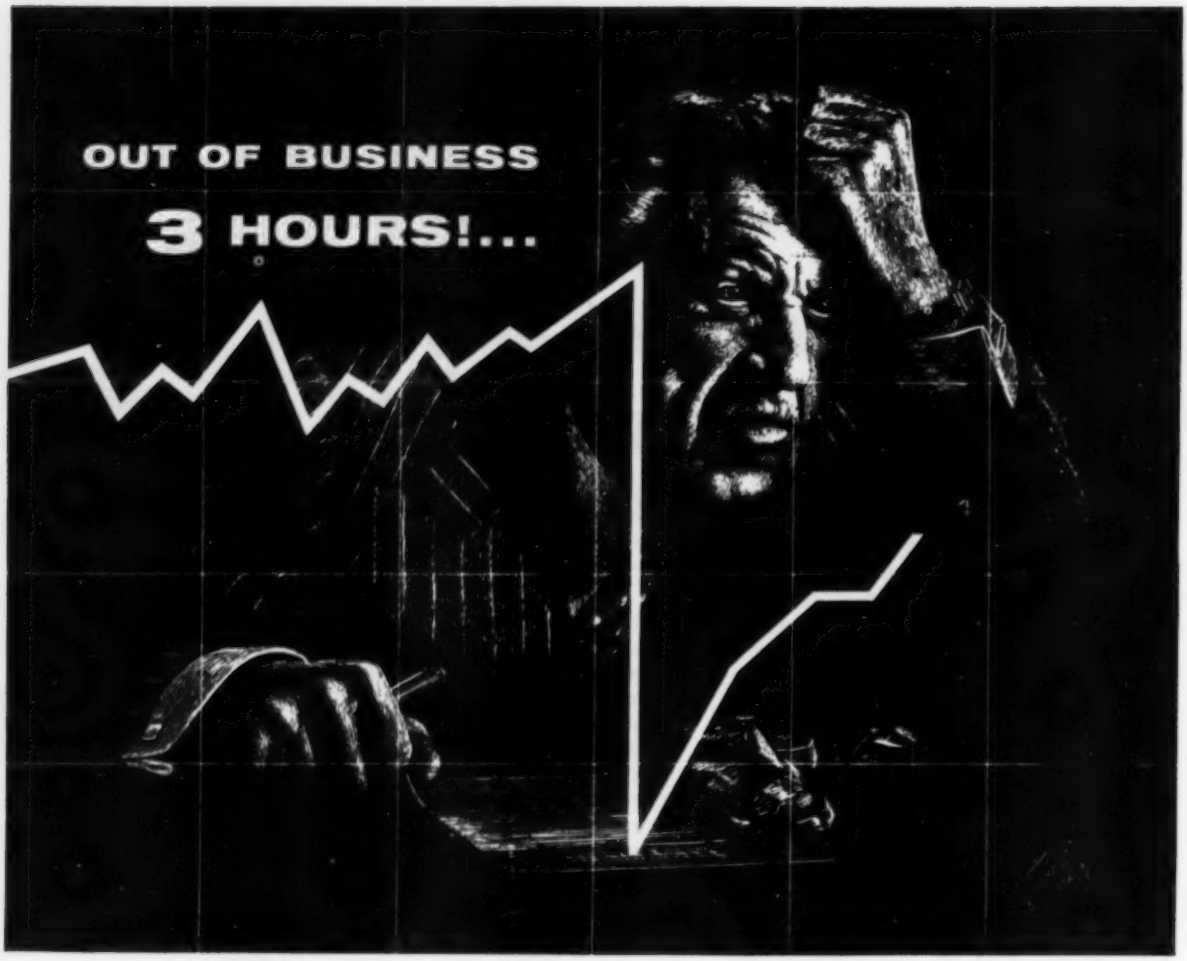

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EC&M Motor Starters could have prevented this work stoppage . . . the costly downtime, the delay, the repairs. Unlimited protection against fault currents, regardless of their magnitude, is assured by the Valimitor Starters (volt-ampere-limitor) for 2200-5000 volt motors.

When you install these Valimitor Starters, there is no need to calculate existing KVA . . . no problem of estimating future requirements. These unique Motor Starters will limit the maximum fault current to 25,000 KVA, even if the bus has infinite capacity.

In addition to the Valimitor type, EC&M Motor Starters are available in 50,000 KVA interrupting capacity. Both can be supplied with weather-resistant, explosionproof, or other enclosures to meet any operating conditions.

Whatever your requirements, EC&M Motor Starters will provide the protection you need against losses caused by fault currents.

Any way you figure it . . . short circuit protection is your best buy!

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Temporary Roadblocks

In his "state-of-the-union" message in February, 1953, President Eisenhower recommended that Congress make a study of the Reciprocal Trade Act and adopt appropriate legislation to extend it. Later he asked for and obtained a one-year extension and at the same time appointed a commission, headed by Clarence B. Randall, to study and recommend a foreign trade policy for the nation.

Early this year the Randall commission issued its report, which recommended that certain features of the Reciprocal Trade Act be extended for three years and that the President be granted authority to adjust tariff rates in exchange for concessions from other nations. Mr. Eisenhower expressed approval of these recommendations and asked Congress to consider them favorably.

Congress has been giving some thought to the problem, but with not too much enthusiasm, due largely to the fact that there is a stubborn resistance on the part of employers, employees and other parties interested in certain industries that would suffer directly if tariffs relating to their products were lowered. Recognizing the strength of this opposition, President Eisenhower two weeks ago let it be known that he would not insist upon a three-year extension of the act, but would yield to another one-year extension in hope that it might afford opportunity for more deliberate hearings on foreign trade in the 1955 session of Congress. As a result, the lawmakers undoubtedly will grant a year's extension before the act expires on June 12.

Some persons may interpret these developments as a slap at President Eisenhower's original policy and at the Randall commission's recommendations. They could amount to that, but it is much more likely that in the long run history will prove that Eisenhower and the Randall commission were more nearly right on their long-term, general foreign trade policy than were their opponents on their short-term, single-industry foreign trade policy.

The world inevitably is moving toward freer trade between nations. Opponents may slow but cannot stop or reverse this trend. Political iron curtains and economic trade barriers are but temporary roadblocks to progress. Eventually they will be thrust aside.

E. C. Shaner

EDITOR-IN-CHIEF

JUST THE BEGINNING: One important factor to be considered in connection with the proposed St. Lawrence waterway is that when the contemplated 27-foot channel from Montreal to Lake Ontario is completed, that will not be the end of channel-deepening in the

fabulous Great Lakes transportation lanes. Completion of work on the eastern international stretch of the St. Lawrence (p. 58) will be the signal for every port west of the 27-foot channel depth to ask for the dredging of its harbors and approaches to that depth.

That would mean rather ambitious programs in the Detroit river, in the Soo locks and in a dozen or more harbors and river entrances. It would probably double or triple the present more or less routine job of removing silt that drifts down from midwest farm lands through short rivers into the busy harbors on the shores of Lakes Michigan, Huron and Erie.

* * *

TIME IS APT LEVELER: Following an editorial on this page in which the editor predicted that eventually the St. Lawrence seaway would serve to educate inlanders to the importance of a free-flowing trade between nations, an esteemed reader wrote an attention-compelling letter in which he was willing to bet that five years after the seaway is completed we will witness the dumping of foreign goods produced by slave labor into the interior of America at prices that will injure our economy.

We agree that the waterway will increase the flow of goods into the interior of our country, but we question whether or not the "dumping" at whatever labor cost may be entailed will be any more severe or harmful than the "dumping" that has been a feature at Atlantic, Gulf and Pacific ports in times of distress.

Air flight has reduced the world to an area that can be covered in not much more than 24 hours. Improved communication is bound to level hours, wages, living conditions and opportunity more rapidly than any of us anticipate today.

* * *

GOOD PRESS AGENTRY: For a number of years the editors in the home office of this publication have devoted part of the noon-hour on Friday to the witnessing of an industrial film. Scores and scores of companies in the metalworking industries have co-operated with us in providing a constant flow of industrial movies of the highest quality.

It is possible that business paper editors, who are exposed daily to all of the press agentry and propaganda of the most skilled industrial public relations experts, might become somewhat bored by this weekly Friday noon exhibition. They are not bored. Interest in these industrial films has been mounting. Employees other than editors have been "crashing the gate." These films have been winning greater attendance by sheer merit.

Possibly your company can accomplish something by means of a moving picture (p. 52) that cannot be done as cheaply or as effectively by any other medium. Why not investigate its possibilities?

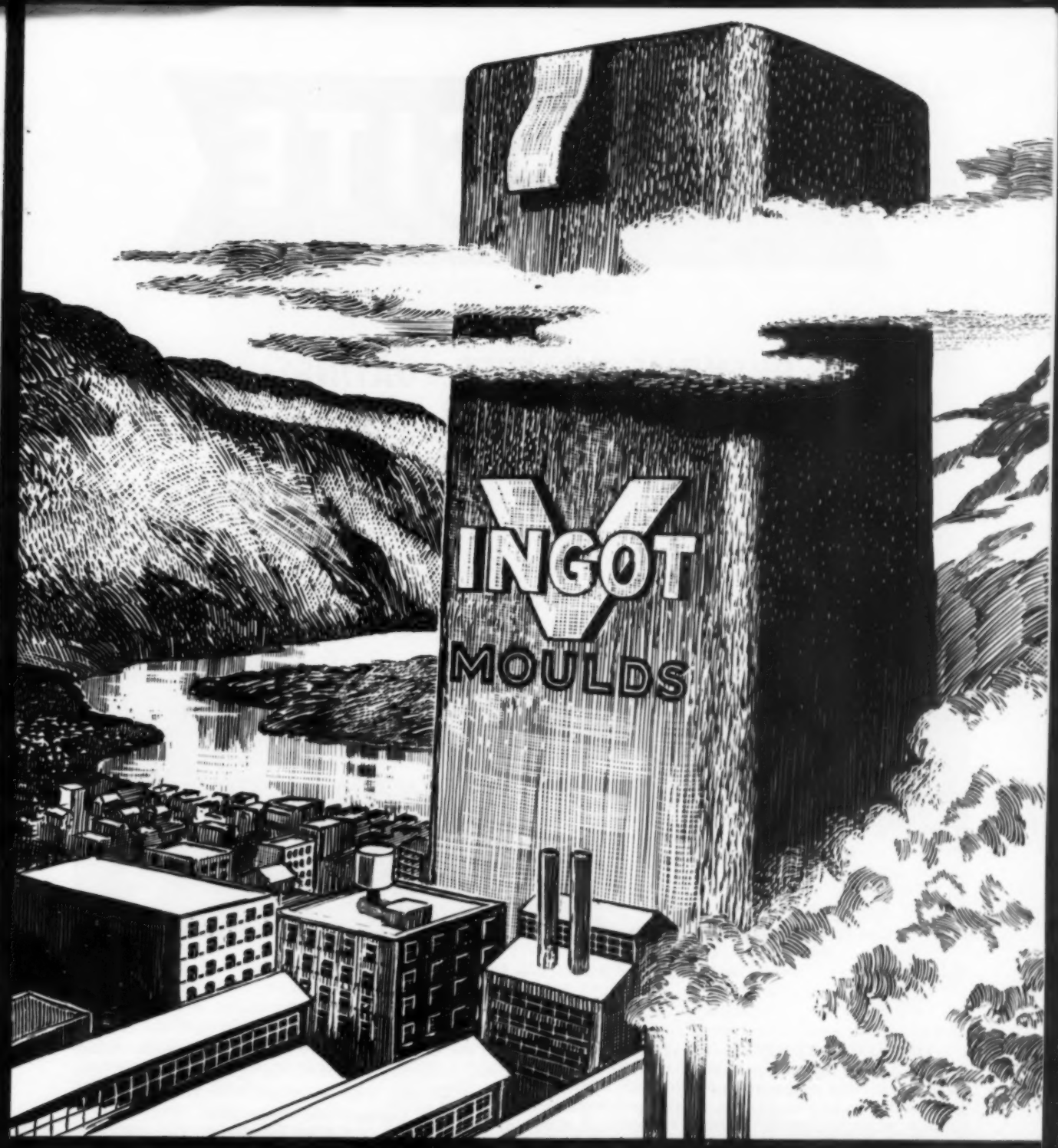
* * *

INITIAL DEMAND HEAVY: Perhaps it is too early to become concerned about the outcome of wage negotiations between the United Steelworkers and U. S. Steel Corp. Nevertheless, it is true that the union's initial demands were much heavier than had been expected. The union negotiators (p. 49) asked for higher wages, a guaranteed annual wage, improved insurance and pension plans, and improvements in hours of work, overtime, severance pay and seniority. If all of these demands were granted, they would amount to about 50 cents per hour per worker. This is a far cry from the 5 to 8 cents an hour which the companies are believed to be prepared to offer. The gap is a bit too wide for comfort.

* * *

SEE BUSINESS UPTURN: In a time like the present when people say that the economic disturbance is really a simple case of inventory adjustment, it may be well to listen attentively to what purchasing agents think about the business outlook. After all, they are experts on inventory problems.

At their 39th annual convention in Chicago last week (p. 47) a majority of the members of the National Association of Purchasing Agents seemed to believe business will improve moderately through the remainder of 1954. George A. Renard, executive secretary of NAPA, warned buyers against the danger of permitting their inventories to drop too low. Martin R. Gainsbrugh, chief economist for the National Industrial Conference Board, believes 1954 will finish strong after a weak start. L. S. Hamaker, general sales manager of Republic Steel Corp., says his company has revised its thinking in the last two months and now expects a moderate upturn in steel production this fall.



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Installations of HERESITE linings to steel tanks varying in size up to 3 million gallons have been made in the Chemical Industry located in Louisiana, Arkansas, Alabama, Tennessee, Georgia, New Jersey, Arizona, Illinois, Texas, Maryland, New York, Wisconsin; in Europe, Germany and Switzerland.

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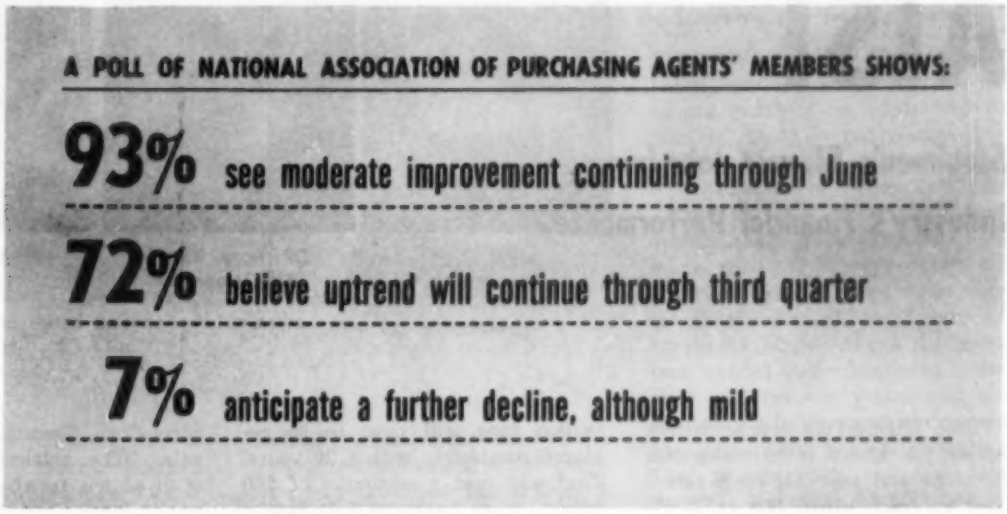
A POLL OF NATIONAL ASSOCIATION OF PURCHASING AGENTS' MEMBERS SHOWS:
93% see moderate improvement continuing through June
72% believe uptrend will continue through third quarter
7% anticipate a further decline, although mild

Buyers' View of 1954 Business: Weak Start . . . Strong Finish

BUSINESS will improve moderately through the remainder of 1954.

That's the consensus expressed at the 39th annual convention of the National Association of Purchasing Agents in Chicago last week (see poll results above). It's the opinion of men who buy materials and components for industry.

Revised Thinking—Many of the buyers say they have revised upward their thinking on the business trend in the past 60 days. They expect no sharp increase, no boom of 1953 proportions. All through the buyers' comments the words "gradual," "moderate" and "normal" appear as descriptive of the anticipated changes.

To support their conservative optimism, the purchasing agents like to talk about the strong sustaining forces which, they believe, will hold the economy on a gentle upward slope. They are — the orderly manner in which we have moved from the boom of 1953 into a buyers' market—the speed with which adjustments have been made —confidence in the business future as indicated by continued high capital spending—the tapering off of inventory liquidation—the stability of prices—tax relief and promises of more reform to come—an active investment market — high disposable personal income—high end-product demand and, of course, the continued population growth.

Dissenting Voices — A few gloomy predictions are voiced by the buyers. None expect a serious continuation of the downtrend which started last fall. They just lack confidence in an upturn. On the dark side they cite declines in employment, in consumer spending for durable goods, in defense spending, in depressed farm income and greater foreign competition in domestic and neutral markets. Generally, this school expects the economic picture to continue at about present levels, with perhaps a slight further dip at July vacation time.

Encouraging views were brought to the purchasing agents from outsiders, too. L. S. Hamaker, general sales manager for Republic Steel Corp., says his company has revised its thinking in the last two months and now expects a moderate upturn in steel production this fall. While he predicted there would be no steel shortage through the mid-1950s, he advised the buyers to watch for new steelworks expansions for the early 1960s.

Reverse Pattern — Martin R. Gainsbrugh, chief economist for the National Industrial Conference Board, sees the business pattern in 1954 as being just the reverse of 1953. Where last year started out strong and ended up stumbling, he sees 1954 finishing strong after a weak start. Business volume at the end of the year will be only slightly under the peak of 1953.

Buyers should watch their inventories lest they get too low, says G. A. Renard, executive secretary-treasurer of NAPA. He predicts the low point in prices, particularly raw materials, will come this summer and advised industrial purchasing agents to capitalize on it.

Steel Prices Firm—Mr. Hamaker predicts steel prices will continue firm for the foreseeable future. The heavy investment the producers have made in new facilities under the five-year amortization plan requires that they make a profit to be able to amortize the facilities. He hints that if any large concessions are made to the steel union in the forthcoming wage negotiations, the added costs might have to be passed along, despite below-capacity operations.

AISI

Steelmen's Biggest Job: Improve Industry's Financial Performance

DR. M. J. KELLY
Bell Telephone

M. D. HOWELL
AISI

. . . more automation and better business lie ahead

STEEL INDUSTRY management's major job ahead is to make fair earnings and pay fair dividends—"not in some years, but on a dependable, regular basis."

So said National Steel Corp. Chairman E. T. Weir, one of the speakers at the annual meeting last week of the American Iron & Steel Institute. He pointed out that from 1928 to 1953, steel industry earnings were below the average for all manufacturing in every year. In five years of that period it had a net loss, whereas the average for all industry showed a deficit in only one year. In 13 of the 26 years, the industry never rose above sixth from the bottom, he said.

Problem Ahead — In the years ahead, Mr. Weir went on, the steel industry will be confronted with financial requirements heavier than ever before. To remain unnationalized, it will have to obtain a large part of the money from the investing public. On the basis of past experience, today's capacity of 124 million tons will have to be replaced completely within 30 years. That will cost a minimum of $30 billion, or an average of $1 billion a year. What's more, money will be needed for additional expansion—not immediately, but fairly soon.

Some of the required money will come from earnings, but most must come from the investing public. That public is wary, said Mr. Weir, and no wonder, in the light of past earnings performances.

Cyclical — Management's main difficulty is that the steel industry is cyclical. But despite swings in demand, the industry must carry the raw materials and facilities for 100-per-cent operations. In the past, the cost of steel to consumers has not included steelmen's cost of being ready to serve, declared the National Steel executive. He believes that cost must be shared by producers and consumers.

Other references to steel prices came up in comments on the current wage negotiations. U. S. Steel Corp. Chairman Ben Fairless said, "The settlement should be such as not to affect prices." Republic Steel Corp. President C. M. White declared that if all the demands by steel workers were granted, there would be no room for prices to match them. He guesses that the demands, if granted, would cost "at least $1 an hour." Other estimates of the cost are not that high (see the story on p. 49), but all executives echoed Mr. White's sentiments about the steelworkers' package when he said, "They must be kidding!"

No Strike?—Mr. Fairless still did not anticipate a strike. If there is none, he believes U. S. Steel's "operating rate will stay around the present level of 73 per cent for the rest of the year." U. S. Steel President C. F. Hood said, "There has been a moderate improvement in business."

Edward L. Ryerson, chairman of Inland Steel Co.'s executive committee, said, "Inland operations are up around 100 per cent and will continue at a full rate for some time." He pointed out, however, that his company is a special case because it is located in an area where capacity is under demand.

A Comparative Matter—The institute's executive vice president, Max D. Howell, regards business as not bad when you consider that 36.7 million tons of ingots have been produced in the first five months of this year, some 3 per cent more than the average du-

Technical session heads: E. C. Smith, left, chief metallurgist, Republic Steel Corp., and W. B. Pierce, vice president, Allegheny Ludlum Steel Corp.

E. L. RYERSON, Inland — C. F. HOOD, U. S. Steel — E. T. WEIR, National

. . . for today, even greater responsibilities for management

ing the same period from 1947 to 1949. He sees much business ahead from highways, new suburban developments, hospitals, prefabricated homes, industrial machinery and new equipment for home owners.

Automation offers great opportunities for steel and every other industry, declared Dr. Mervin J. Kelly, president of Bell Telephone Laboratories, who delivered the Schwab Memorial Lecture. He sees atomic weaponry as another technical area where research for the military promises major contributions to civilian life. He points out that economic applications of such developments may be only five or ten years away.

Award Winners—Institute medals were awarded to William Charles Bell of Stewarts & Lloyds Ltd., Great Britain, and to W. A. Black, chief electrical experimental engineer, Steel & Tubes Division, Republic Steel, for the excellence of their papers presented at last year's general meeting. B. M. Larsen, supervisor of process metallurgy research, U. S. Steel, won the regional technical meeting medal for an outstanding technical paper presented in Birmingham last October.

All institute officers were reelected.

New England Wins Extension

The certificate of necessity for a $26-million electric furnace steel mill, granted to New England Steel Development Corp., has been extended to Oct. 30, 1954. Walter Raleigh, executive secretary of the New England Council which owns New England Steel, has expressed confidence that the steel producing plant will be established.

Says Mr. Raleigh, "Metalworking of one kind or another employs some 640,000 persons in New England. That's a tremendous growth from 316,700 workers so employed in 1939. The number of New England metal-using manufacturing plants increased from 2812 in 1939 to 7800 in 1954. That's a big and growing market for an electric-furnace type of mill."

U.S. Steel To Make Plastic Pipe

Manufacture of plastic pipe will begin sometime in September at the Gary works of National Tube division, U.S. Steel Corp.

Screw-type extruders are being installed to make ½ to 6-inch-diameter pipe from polyethylene, polyvinyl chloride and other plastics.

The move puts three basic steel producers into plastic pipe production—U.S. Steel, Republic Steel Corp. and Youngstown Sheet & Tube Co.

Pensions in 1960: $6.6 Billion

Industry will pick up a $6.6-billion tab for pensions in 1960, predicts Charles L. Dearing, deputy undersecretary of Commerce for transportation and author of the book "Industrial Pensions."

He estimates that 22 million workers will be covered by industrial pension plans by that date.

Steel Union Asks a Lot

Steelworkers' program would hike steel industry costs at least 50 cents per hour per man

THE WEATHER VANE of steel-union contract negotiations has swung gently from "fair and favorable" to "fair but changeable" with presentation of the United Steelworkers of America's demands to U. S. Steel Corp. Substantially the same proposals were made to other steel producers.

Union demands were much heavier than expected, containing requests for higher wages, a guaranteed annual wage, improved insurance and pension plans, and improvements in hours of work, overtime, severance pay and seniority. The package would cost steel producers a minimum of 50 cents an hour per worker if granted. Other estimates put the cost as high as $1.

Counter Offer—Informed industry men estimate the steel producers will offer a 5 to 8-cent package increase in place of the union demands. Thus, while the odds are still against a steel strike this summer, the bellwether negotiating sessions between U. S. Steel and the United Steelworkers are not going to be the tea parties which were expected earlier. Those sessions are scheduled to reconvene this week.

Immediate reaction to the union demands was—why had Steelworker President David J. McDonald pushed demands so high? One of the major reasons is the rivalry between Mr. McDonald and CIO and UAW President Walter J. Reuther. Ample evidence that friction between the two labor leaders hasn't lessened was Mr. McDonald's recent request of newsmen that they refer to the steelworkers' union without mentioning the "CIO."

The Challenge—The same week, Mr. Reuther was announcing autoworkers would begin getting the 5-cent-an-hour increase beginning after May 29 as provided for by the annual improvement factor. Autoworkers actually will net only a 4-cent-an-hour raise since there is a 1-cent-an-hour decrease in the cost-of-living allowance. But the challenge is clear.

Foreign aid has spurred exports decidedly, but with economic aid tapering, industry must take over from the government to push nonmilitary trade

Millions of $	1948	1949	1950	1951	1952	1953	1954*
Total U. S. Exports	12,614	12,000	10,100	14,900	15,165	16,900	16,500
Total Military & Economic Aid	5,270	5,652	4,154	4,623	5,042	6,400	6,915
Military Aid	326	216	524	1,480	2,681	4,371	5,600
Economic Aid	4,944	5,436	3,630	3,143	2,361	2,029	1,315

* Estimated.
Source: Department of Commerce.

EXPORT TRADE —it's industry's job now

By SAMUEL W. BAKER
Associate Editor

"DO IT YOURSELF" is now the byword in building export trade.

As a worldwide buyers' market returns and government economic aid declines, industry must take the lead in holding and expanding its sales abroad.

Scaled Down — U. S. economic aid—amounting to over $34 billion through 1953—financed nearly 30 per cent of our exports in the postwar period. It has been scaled down markedly, and shipments of civilian goods financed by this aid have dropped sharply.

Since the beginning of World War II our exports of goods and services have been abnormally high in relation to world exports and to our gross national product. But until recently, our exports have met little competition.

The dollar shortage up to last year was a deterrent to higher American exports. The dollar gap is vanishing as foreign nations get more gold and dollars. In 1953 dollar reserves abroad jumped $2.3 billion to about $23-billion. Foreign exchange rates have become more stable at lessening discounts from official rates. This improves the ability to buy from us—and to compete with us.

'54 Forecast—Of the $19.4 billion available to foreign countries in 1954, about $11.8 billion will be spent commercially in purchase of U. S. merchandise, estimates the National Foreign Trade Council. This would be some $400 million less than in 1953, owing largely to the possibility of "a drop in foreign demand for U. S. industrial products as a result of increased local production and intensified competition by other sellers."

While over-all exports constitute less than five per cent of our gross national product, this market is unusually important, especially to metalworking. About one-third of our rolling mill machinery goes overseas, over 20 per cent of our textile machinery, tractors and sewing machines. Better than 15 per cent of U. S.-produced office equipment, motor trucks, printing equipment, and oil field machinery and tools find buyers outside the country.

Machine tool exports are now below prewar levels in constant dollars, points out Marshall Smith, deputy assistant secretary of Commerce for foreign affairs. In terms of 1948 dollars, we shipped $133 million abroad in 1938, $158 million in 1939. With the military build-up in 1952, shipments totaled only $115 million, and the total slipped to $108 million in 1953.

Policy Needed — International trade is still hobbled by restraints. At home, the present administration has attempted to formulate a comprehensive foreign economic policy on a realistic basis, but has run into opposition from the protectionist members in Congress.

Nevertheless, conditions exist today for a greatly expanded foreign trade. Among industrial products with biggest potentials are machine tools and machinery, electrical equipment, construction machinery, agricultural implements and tractors.

It's Up to You—The challenge to American enterprise is clear as emphasis shifts toward individual efforts to expand exports. "A passive approach toward the dynamic problems of making a market has all-too-frequently marked the approach of American exporters," says George L. Wilcox, vice president-operations, Westinghouse International Co.

You can't drift into world trade or expect to build a market overnight. Export selling is said to be about three times as tough as domestic selling; your product must show real advantages and possibilities of success to justify your efforts.

Sales Formula—Present facilities and techniques can often be adapted to the export market. The job isn't easy, but it can be done: Look how Coca-Cola gained product acceptance in France, a nation of wine drinkers.

Market analysis will help you get your bearings and establish a plan of action to enter into international trade.

Figure Your Chances — First analyze the market's potential ca-

AN OVERSEAS ORGANIZATION

. . . watch these snares

1. May the business legally be conducted by foreigners in the particular country?
2. If so, will the foreign owner be allowed to retain effective control over the management of the business?
3. Are the property rights of investors adequately protected?
4. Will the organization be permitted to hold real and other property of the type necessary to its operation?
5. Will earnings arbitrarily be limited and may earnings and capital be repatriated?
6. Will the organization be able to employ necessary personnel, including that not native to the country?
7. Will the organization be allowed to import necessary machinery and raw materials?
8. Do the laws of the country afford ample protection to industrial property rights, such as patents, trademarks, and copyrights?

BUILD BUSINESS ABROAD

. . . check these pointers

1. Develop a long-range trade development program. Sporadic promotion won't work.
2. Research your market. Determine potential ability and willingness to buy your product, local tastes that may modify this potential demand.
3. Look at the foreign market through your customer's eyes. Give him what he wants, not what you think he wants.
4. Be prepared to offer adapted or stripped-down products—in many markets abroad you'll be operating in an economy of scarcity, not plenty.
5. Watch shifting patterns of trade and needs; conform with work habits, customs and traditions of the country you're selling.
6. Adapt U. S. techniques in promoting sales abroad.
7. Keep your marketing plans flexible and open for new trading ideas.
8. Take advantage of trade leads. Check trade lists for opportunities for your product in specific areas.

pacity to absorb your product. Consider population and its component elements. Determine purchasing power of the market; valuable guides are per capita imports and their character. Local tastes are an important factor, affecting design, color, trademarks and packaging. Pronunciation and connotation of trade names can make a difference: Eastman Kodak renamed its Brownie Hawk-Eye camera the Brownie Fiesta for the Spanish market.

Learn the effect of official regulations such as import quotas, exchange restrictions, tariffs and other controls. Establish the existence and character of competition from domestic producers, from other American producers, from producers in other countries. Study quality, terms and prices of principal suppliers and the actual conditions under which they operate. Consider your ability to adopt a measure of flexibility in sale terms to cinch a transaction.

Check means of distribution, facilities for shipment and packaging required to figure costs. Investigate best sales methods and advertising requirements; experience in the American market is seldom an accurate criterion. Find the best selling seasons. Finally survey business and credit conditions to learn if marketing conditions are favorable at this time. A good outline for analyzing your product's export possibilities, as well as reliable sources for information and advice, is contained in the Commerce Department's booklet, *Guide for New World Traders*.

Modus Operandi—Your export system can take any of several forms. You can export directly under an export manager, a separate department or a subsidiary. You can also utilize an established export organization. The independent combination export managers are firms providing export management services for several noncompetitive companies, operating as if they were full-time employees. Export merchants are professional middlemen, buying merchandise for foreign importers. Manufacturers' export agents act as sales representatives for U. S. manufacturers, often handling noncompetitive lines.

Proper organization of your export business can result in significant tax breaks. Separate subsidiary companies for selling abroad are now popular, giving benefits of separate accounts and reducing risks of double taxation. Licensing local companies to manufacture goods according to your methods and standards is gaining. It's one way American manufacturers can combat native competition abroad and participate in markets which otherwise wouldn't be available. Value of such American manufactures abroad now total over $5 billion. Today's private investments abroad now approach $27 billion.

Work and Imagination—In planning for the long pull, sell what you can and where you can. It often requires making a market where none existed. Ten years ago there were only 500 tractors in Peru when a farm machinery program to encourage new agricultural methods was instituted. Last year Peru had 4500 tractors, and the value of U. S. farm machinery exports had shot up twelve-fold.

Techniques of production and distribution so successful in this country can be adapted to export markets. Advertising by U. S. firms in export trade ($280 million last year) amounts to about 1.9 per cent of export sales, less than is generally allotted in domestic markets.

Get Your Share—The need for hard, creative selling in export markets is pointed up by the fact that American exporters are getting a smaller share of the world market, and many traditional American products are in danger of replacement by goods of foreign origin.

Yet the unsatisfied demand for goods by people abroad is tremendous. It's American industry's job—and opportunity—to satisfy more of that demand by adapting techniques that have worked so well in the U. S.

Industrial Movies: Tool with Potential

Cinecraft Productions Inc.

MOVIES—"undivided attention for 30 minutes while you tell your story."

True, that's an industrial movie producer's pitch. But it's logical. And with costs down sharply since World War II because of technological improvements, movies can be an effective tool for industry.

Expensive—Rule of thumb costs for today's industrial movies in color run between $1000 and $1500 per running minute of film. Sales films are the most popular, but more movies are being made for training purposes, personnel relations, public relations and new product introduction.

One of the newest uses is financial reporting, says Frank Siedel, president of Storycraft Inc., Clevland. Year-end reports to stockholders are generally considered dull, routine presentations of a jumble of figures. Many companies are turning to movies and the techniques of animation to liven these meetings with more comprehensive, understandable—and at the same time entertaining—financial reports on film. Chesapeake Industries Inc. recently rented a Cleveland movie house for an evening to present its "annual meeting" to over 700 people who sat rooted to their seats for two hours while they saw a report on the operations of the firm's nine subsidiaries.

Advantages—Flexibility is perhaps one of the biggest advantages of industrial movies. Modern movie techniques permit simple demonstration of operations like the internal operations of intricate machinery which would otherwise be practically impossible to show or explain in any other manner. Then, too, different sound tracks can be cut on the same film to achieve two or more purposes. Cinecraft Productions Inc., Cleveland, recently produced one film for a company and by using four different sound tracks made four movies from the one film—one for showing to dealers, one to show to plant personnel, one for dealers to show to customers and one for public showings.

But making a movie is no part-time assignment for an assistant's assistant assistant. Decision to make a movie and the purpose it's to accomplish is one for top management. Then a responsible person who can get production lines shut down with minimum of delay and who understands the purpose of the movie and operations to be filmed should follow the movie from start to finish.

First Step—Blueprint for the movie is the script. It's here each detail should be considered and worked out in advance of on-the-scene shooting. Most producers have professional writers to help you prepare your script, but you must supervise it at all times because the writer is seldom an authority on your operations. Put your best foot forward at all times in a movie: Be sure good plant housekeeping is evident, be sure safety is practiced to the letter, be sure waste of materials and manpower is not evident in the movie. Your operations will be under closer scrutiny in a movie than by a guest on a plant tour.

Making a movie is only half of the task—it must be effectively distributed or it is worth little, no matter how much it cost to produce. Officials at Republic Steel Corp. who recently released their new movie, "Steel Frontiers," estimate that their distribution will cost them as much as the actual movie production.

Big Audience—Actually, distribution should not be difficult. Practically every service club, church group, school, company and organization have movie projectors and are looking for top-notch movies to fill program schedules.

First consideration is what audience do you want the film to go to and how large is it. A good average for an active film is one showing per week. You should have enough prints made to be sure you meet the demand without too much waiting.

Reaching Viewers—Some companies, like Republic, contract with professional distributing agencies to get the film out. Peninsular Grinding Wheel Sales Corp., Detroit, is handling its own distribution by advertising in trade journals and having company personnel show the film. Other firms send out films on requests gained by advertising; some have dealers and salesmen show the films. City libraries with film bureaus and industry associations offer other possibilities.

One official sums it up like this: "If the movie is good, demand will take care of distribution. If it's bad, it should be burned anyway."

FTC Revamped

New organization of FTC aims at greater efficiency and economy. Personnel shifted

A STREAMLINED Federal Trade Commission will go to work July 1, following a major reorganization announced by Edward F. Howrey, chairman.

That reorganization includes regrouping all investigative activities in a newly formed Bureau of Investigation, all trial work in a new Bureau of Litigation, and voluntary compliance procedures in a new Bureau of Compliance. Personnel within the FTC has been shifted to fit the new organizational lines.

Efficient and Economical—The move is designed to speed up handling of FTC cases and focus responsibility for that handling on the appropriate individuals within the commission. Said Chairman Howrey: "I am confident that the integrated staffs contemplated by the report will not only be more economical but will provide the basis for a more effective administration. . ."

The reorganization move is based on results of an independent management firm survey begun last year. Recommendations of that survey outlined the elimination of about 50 per cent of the procedural steps now required within the commission.

Dissenting Voice—Adoption of the new organization plan was not recommended unanimously by the FTC commissioners, however. Commissioner James M. Mead said: "The last reorganization of the commission was in 1950 . . . reflecting to a major degree the suggestions and recommendations of the Hoover Commission. I am not aware of any persuasive reasons indicating a need for this reorganization of the FTC."

Commissioners remain: Mr. Howrey, chairman, Mr. Mead, Lowell B. Mason, Albert A. Carretta and John W. Gwynne. Heads of the newly formed bureaus include: Joseph E. Sheehy, director, Bureau of Litigation; Charles E. Grandey, director, Bureau of Consultation; and Harry A. Babcock, director of the Bureau of Investigation.

Rem-Cru

One-tenth of all mill product output assures . . .

Plenty of Titanium Freed for Civilian Applications

CIVILIAN USERS of titanium mill products got an assured-minimum supply of those products for peaceful applications through the Business & Defense Services Administration's order M-107.

That order authorizes producers of titanium mill products to set aside 10 per cent of their monthly output for civilian and industrial users.

Way Over Head—But the 10 per cent of total supply for civilian applications is well over demand (now less than 3 per cent). Most industrymen believe it will be another year, maybe two, before civilian users will be taking the full 10 per cent.

What the order does do right now is give companies with potential civilian applications assurance that the product will be available when their potential applications have been developed into reality.

What It's About—Present output of titanium sponge is running at a rate of about 3600 net tons a year. With production increases already in the books, output may go as high as 5000 tons in 1954. But the government is stock-piling sponge and only about 7 out of 10 tons of titanium sponge gets into mill product form. Thus the BDSA order affects between 250 and 350 tons of titanium mill products a year at the present and short-term-future rates of production.

How quickly the above tonnages of titanium mill products will actually find a home in civilian applications depends on how fast industry finds the answers to two big problems. Most important is product development. "The problem is," says T. W. Lippert of Titanium Metals Corp., "titanium is usually wanted for unusual jobs for which it's necessary to develop a new product—for example, titanium-clad metal, large diameter pipe and tubing, and heavy plate."

Matter of Price—The other problem facing commercial users of titanium mill products is one of economics: In what civil applications will titanium mill products prove economically feasible? But that question can't be answered with any degree of accuracy until product development is carried farther.

The gap between what's now available to civilian users of titanium mill products and what's actually going to that market shows there is plenty of room in the civilian field for new users. C. I. Bradford of Rem-Cru Titanium Inc. speaks for all mill producers when he says, "The door's wide open to new civilian consumers. And you can be sure if you have a promising application, we'll help you."

By E. C. KREUTZBERG *Washington Editor*

U. S. INDUSTRY: Schoolhouse for Foreign Businessmen

U. S. BUSINESSMEN are to carry more than half the teaching chores in a course newly inaugurated by the government to acquaint foreign businessmen with American managerial "know-how."

Where preceding similar courses were aimed at imparting technical savvy, this course is slanted toward giving foreigners an understanding of the American concept of management. And, instead of concentrating on specific administrative practices and managerial techniques, the new course aims at imparting one big idea—the idea of producing goods, even luxury products, for the mass market at prices the public can pay and always at a profit to the manufacturer.

Critical Difference—That axiom of U. S. management is now regarded as one of the most important American-made concepts that can be transmitted to developing countries. Carl N. Gibboney, director, Foreign Economic Development Staff, Bureau of Foreign Commerce, told STEEL: "It may prove in the years to come to be the difference between the perpetuation of the current wide-scale poverty and limited markets or, instead, the gradual building up of a genuine middle class and the steady improvement of the lot of the vast numbers of people in industry, trade and on farms."

To qualify as students in the course, foreign businessmen must have had a higher education, must hold at least a middle management job in business or industry, and be fluent in the English language. That is, they must be types who can apply the lessons learned in the U. S. to the economic progress of their own countries.

Program in Practice . . .

Illustrative of the caliber of applicants accepted for this eight-month course are Faustino Garzon, chief accountant, National Steel Co., Bogota, Colombia, and Gustavo Balcells, domestic sales manager, Chilean Steel Works, Santiago, Chile.

They spent a week at the Washington International Center where they heard lectures on U. S. government, politics, private enterprise system and the American way of life generally. Next they spent a semester at Toledo University, Toledo, O., studying industrial management in an atmosphere in which the mutual interests of management and labor are taken into consideration.

Beyond that, each man's course was laid out specially for his requirements. Mr. Garzon was placed for a month with Inland Steel Co., whose accounting system he studied. He also was given turns with International Harvester Co., and with National Cash Register Co., and International Business Machines Corp. for specific information on the use of modern accounting machines. Mr. Balcells' course was tailored with the accent on distribution: He spent a month each with Bethlehem Steel Co. and U. S. Steel Corp. In addition, both men were afforded interviews with some dozens of diversified businesses.

Both of these men were in a group of 17 foreign businessmen who have completed the course and returned to their home lands.

The Best Teachers . . .

Reason for the heavy reliance on industry for help in this new program is voiced by Mr. Gibboney: "For one who desires to learn about American management, there is no substitute for learning from business and industry itself." Industry will not be asked to divulge any of its vital trade secrets, however. Applicants who seek that kind of information will not be accommodated.

In fact, any venal considerations are distinctly taboo in conducting the course. But government officials point out that the more junior executives that become informed on American management concepts, the more friends we will have in influential positions abroad. That should not hurt our foreign trade in the future.

Paying the Bill . . .

The management course is being conducted by the Commerce department's Bureau of Foreign Commerce. Expenses are paid by the countries sending students, by the United Nations, or by the U. S. Foreign Operations Administration or State department, under the Mutual Security and International Development acts.

It's still too early to determine which industrial firms will be asked to co-operate in the next session of the course since that class won't get started in Washington until September.

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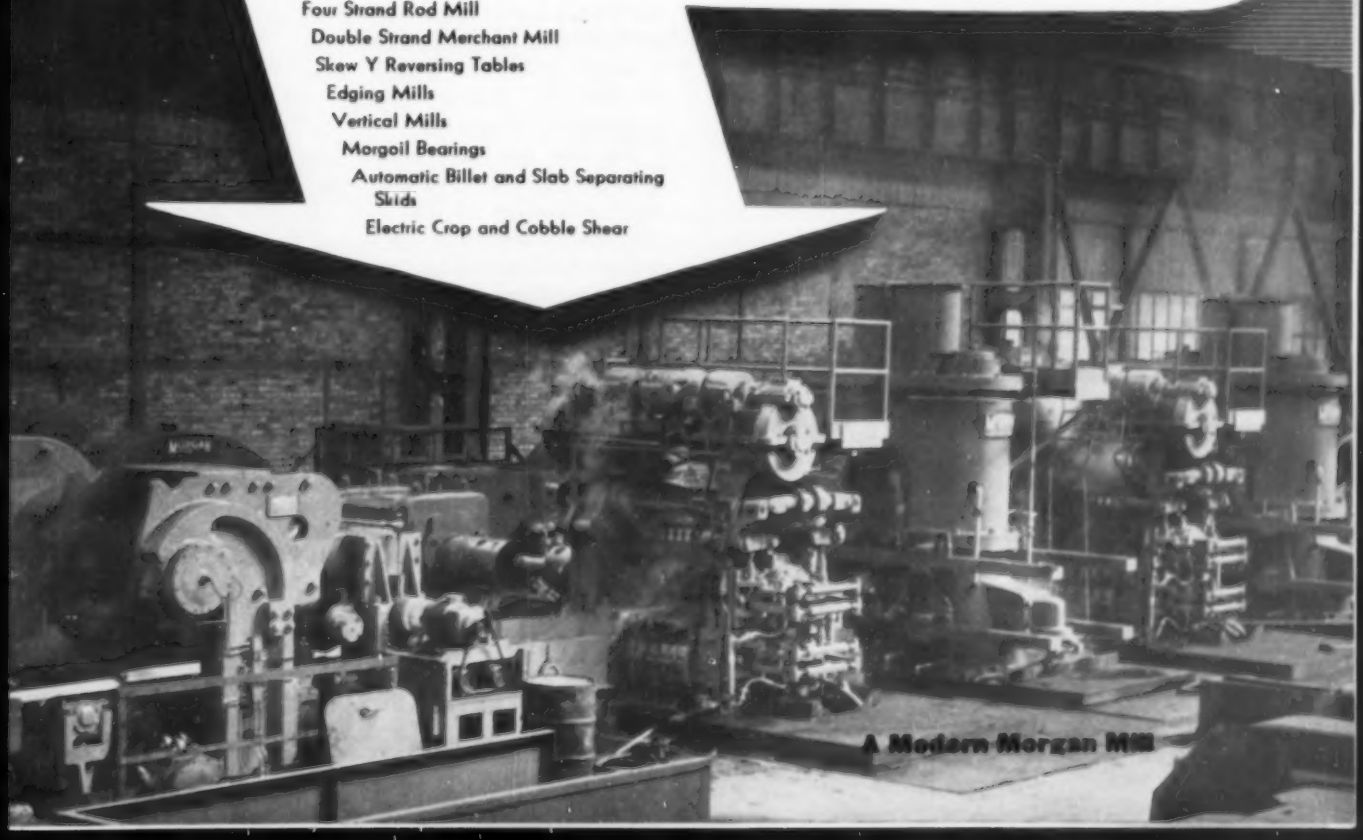
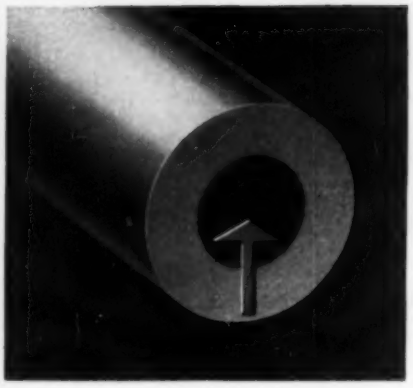


A Modern Morgan Mill

a hole here is annoying . . .



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Job Shop Die Casters' Shipments of Zinc and Aluminum Alloy Die Castings

END USE	ZINC ALLOY (thousands of pounds)				ALUMINUM ALLOY (thousands of pounds)			
	1950	1951	1952	1953	1950	1951	1952	1953
Motor Vehicle	173,250	137,800	126,500	165,500	29,350	21,000	28,950	47,900
Home appliance	71,000	53,450	50,300	68,500	39,350	26,300	27,150	37,750
Office, industrial, commercial machines	31,250	26,900	29,500	36,450	26,300	18,650	16,950	29,800
Scientific, communications, photographic equipment	18,000	15,200	16,750	22,400	16,300	12,300	13,000	16,900
Plumbing, heating & builders' hardware	23,000	15,750	13,600	18,200	5,100	4,125	2,175	4,100
National defense	750	25,100	15,200	15,800	2,300	18,100	30,850	35,000
Other	22,750	17,800	14,150	17,150	8,800	5,525	8,425	13,350
Total job shop	340,000	292,000	266,000	344,000	127,500	106,000	127,500	185,000
Estimated captive	194,000	160,000	140,000	168,000	16,500	22,000	28,000	51,250
Total die casting	534,000	452,000	406,000	512,000	144,000	128,000	155,500	236,250

Source: American Die Casting Institute.

Die Castings: Upturn This Fall?

Manufacturers of the bellwether product expect model changes later this year to boost their volume. This year's sales will be good but below 1953 levels

THE DIE IS CAST — manufacturers of die castings foresee an upturn this fall.

That prediction has wide significance because die casters do business with a wide range of metalworking plants (see the table). An upturn for die casters means prospects are better for their many customers. Die casting volume for 1954 won't match the 1953 pace, but the worst is over in most segments of the industry.

Low Point—William J. During, president, Precision Castings Co. Inc., Fayetteville, N. Y., concedes there has been a slowdown in casting orders this spring. "But," he says, "there are two optimistic indications of a possible improvement in late fall business. These are new die business, which is at the highest level in our history, and a definite upswing in stock die orders for deferred fall delivery. Our die shop is now working at capacity on newly designed consumer products and components.

"Raw inventories in industry are at an all-time low. This anticipated fall improvement will be helped also by the completion of the current transition period from Korean production to peacetime operations in many industries."

Shift in Metals—The table indicates that aluminum alloy die castings have made heavier gains than the zinc product. In the automotive industry, the best customer for die castings, zinc requirements have slipped since 1950, while aluminum gained considerably. David Laine, secretary, American Die Casting Institute, explains that aluminum has gained in automotive uses partly because weight and engineering considerations dictate its use in die castings for automatic transmissions.

Lead base and copper base alloy die castings are maintaining their relative positions. Magnesium is gaining in die castings, although the total poundage used (4.3 million in 1953) is still small compared with most of the other metals. The 1954 ratios of the various metals used in die castings promise to be about the same as in 1953. Zinc and aluminum, of course, will remain the major metals used by the industry.

The Look Ahead — Die casters predict that extensive model changes this fall in autos and appliances will mean a greater per-unit need for their product. Both auto and appliance output in 1954 will be under last year's record. But the expected higher per-unit requirements for die castings support the industry's renewed optimism.

Stockpile Hits 60 Per Cent

General Services Administration added $349 million worth of strategic goods to the stockpile in second-half, 1953, compared to $383-million in the first half.

Total value of the cache at year-end was over $4.2 billion, about 60 per cent of the $6.8-billion stockpile goal, according to Office of Defense Mobilization.

ODM says 39 of the 75 stockpile materials are either on hand or on order in sufficient quantities to achieve the goal and another 13 are within 80 per cent of the goal. Seven stockpile materials remained under short-supply quotas at the end of 1953—chromium, cobalt, columbium - tantalum, diamond bort and grinding wheels, hog bristles, nickel and selenium.

Tool Shipments Drop 13 Per Cent

Machine tool shipments totaled $328.4 million in first-quarter, 1954, down 13 per cent from the same quarter, 1953, according to Business & Defense Services Administration. New orders were also down—from $83 million per month in the first three months of 1953 to $45 million per month in 1954.

Cutting tools accounted for $260.9 million of first-quarter shipments, while forming and shaping tools made up $67.4 million. Backlog at the end of the quarter was for about five-months' production, compared to an eight-month backlog at the end of first quarter, 1953.

No. 2 in a series of three articles

The Seaway . . .

New Channel for Business

By WILLIAM M. ROONEY
Market Editor

CONSIDERABLE ocean - going shipping now reaches the Great Lakes via the St. Lawrence river. Last year, for instance, 214 foreign vessels with an estimated 171,200 tons of cargo called at Cleveland on Lake Erie.

But present foreign traffic on the lakes is restricted by the 14-foot channel depth of the St. Lawrence river passage upstream from Montreal and inadequate facilities and shallow harbors at Great Lakes ports. Most sea-going freighters draw 20 feet or more. They can't negotiate the shallow 114-mile bottleneck in the St. Lawrence between Montreal and Ogdensburg, N. Y.

Special Vessels—Even those vessels that do reach the lakes must be specially constructed. They are smaller than normal ocean carriers, with water draft no more than 14 feet, and over-all length of less than 258 feet. They can carry only about 1800 tons of cargo upstream from Montreal.

From the St. Lawrence Gulf to Montreal, more than 500 miles, there are water depths of 30 feet or more. But in the 114-mile stretch between Montreal and Ogdensburg the canals and locks which permit passage around the rapids and shoals are only 14 feet deep. From there on to the head of the Great Lakes, 1200 miles away, controlling depth of channels is 21 feet upbound and 25 feet downbound.

Building of the proposed 27-ft deep St. Lawrence seaway, approved early this month by Congress after more than 30 years' debate, will eliminate the Montreal-to-Ogdensburg chokepoint and extend by 600 miles to Seven Islands, Que., the effective Great Lakes waterway, Duluth to the Gulf of St. Lawrence, some 2000 miles.

NEA

Start of New Vistas—Opening of the river to larger vessels holds tremendous significance for commerce and industry in the entire Great Lakes region. But the seaway, in itself, will be only a step toward realization of the over-all potential—bringing a large section of the Midwest to the seacoast.

The proposed deep-water channel, under present legislation, will extend only to Toledo, O., though ships with a 25-foot draft, by lightening loads to 80 per cent of capacity, will be able to reach Detroit, Milwaukee and Chicago. At the same time, lake cargo carriers will be able to traverse the 27-foot channel to the sea with full loads.

Three Parts—There are three parts to the over-all seaway proposition. First is the international power project at the International Rapids section of the river. Then, there is the seaway from Montreal to Lake Ontario. Thirdly, there is the problem of deepening connecting channels between lakes Erie, Huron and Superior, and the deepening of harbors and installation of port facilities.

Only the seaway proper is covered by the legislation. Power development is a joint project of the state of New York and the province of Ontario. Lake-connecting channel and harbor improvements will require new legislation—probably not forthcoming for some years.

Key Is Power—Power development is the keystone of the project. It is the impelling force behind Canada's urge to get construction under way quickly. Canada needs power for its expanding economy, and the International Rapids of the St. Lawrence present a mighty source. Power consumption in Ontario has increased 10 to 15 per cent annually since 1946. Although $750 million has been spent on development since the war by the Ontario Hydro-Electric Power Commission, industrial growth has outpaced power expansion.

The seaway power project will develop 2.2 million horsepower to be divided equally between Ontario and New York state. It will require dams in the Long Sault rapids and two power houses, one on the Canadian side and one on the American. Each will develop 1 million horsepower —more than at Hoover Dam and nearly as much as at Grand Coulee. A ready market for the 12.6 billion kilowatt-hours of energy to be developed is in sight in Ontario, New York, and adjoining states.

Major seaway projects are dam, powerhouse and locks at International Rapids

The Landscape Changes—Two dams will be built near Ogdensburg and Massena, N. Y., according to present plans. The power house on the American side will be constructed near Massena. The dams will result in flooding territory on both sides of the river but chiefly on the Canadian shore. Removal of a number of communities will be necessary. A control dam is to be built near Iroquois Point, Ont., to regulate the level of the pool to protect water flow downriver to Montreal. Dikes also are planned.

Total cost of the power development is estimated in excess of $600 million to be borne by the province of Ontario and the state of New York. Pending decision of the Supreme Court on validity of the federal license granted the New York Power Authority to go ahead with Ontario on the project, the authorities are pushing engineering planning to get a quick start on construction once they get the green light. The New York authority has borrowed $1-million to finance engineering planning. Issuance of bonds to finance actual construction awaits the court's decision.

Faster, Too—The proposed seaway not only will eliminate bottlenecks in the river to permit passage of larger vessels, but it should markedly speed up traffic. It will provide a 27-ft channel from the Atlantic Ocean to Lake Erie, over 1000 miles, by means of seven new locks at the International Rapids chokepoint, replacing present 14-ft facilities. Three of the seven locks will be on the American side. All will be 80 feet wide, 800 feet long and 27 feet deep. Other existing facilities, such as the Lachine and Soulanges locks, will be enlarged and deepened to 27 feet, and where necessary new canals will be built and channels dredged.

Some questions as to dam sites remain to be worked out, as well as other details. Consequently, it may be spring of 1955 before an actual start on construction is possible.

Cost of the seaway, estimated in excess of $300 million, will be borne by the two countries. The U. S. share will run to about $105 million, while Canada's is expected to exceed $200 million. Costs will be covered by toll charges which are to be worked out jointly by Canadian and Americans.

Related Project—Beyond construction of the seaway proper, but a directly-related part of the over-all proposal, is the deepening of channels and harbors above the St. Lawrence to permit the larger ships to move all the way from the Atlantic to the head of the Great Lakes. Pressure is expected soon for legislation for such work. U. S. Engineers Corps, under an appropriation made a year ago, now has a survey in progress expected to be completed by fall.

This additional work will cost more than $200 million and still more should channel deepening to 35 feet be undertaken, as is suggested.

Port Development—In addition to the deepening of channels and harbors, a large amount of construction in the way of port facilities, warehouses, docks, wharves, etc., is envisioned at such points as Buffalo, Cleveland, Toledo, Detroit, Milwaukee, Chicago and Duluth. More railroad facilities and new, improved highways are seen as a requisite throughout the Great Lakes region if the trade potential opened by the seaway is to be fully realized.

This will mean expenditure of hundreds of millions of dollars, both public and private. Indications are the work will not be long delayed with affected municipalities already bestirring in preliminary planning. Economic surveys are being undertaken and state government moves initiated looking toward active launching of

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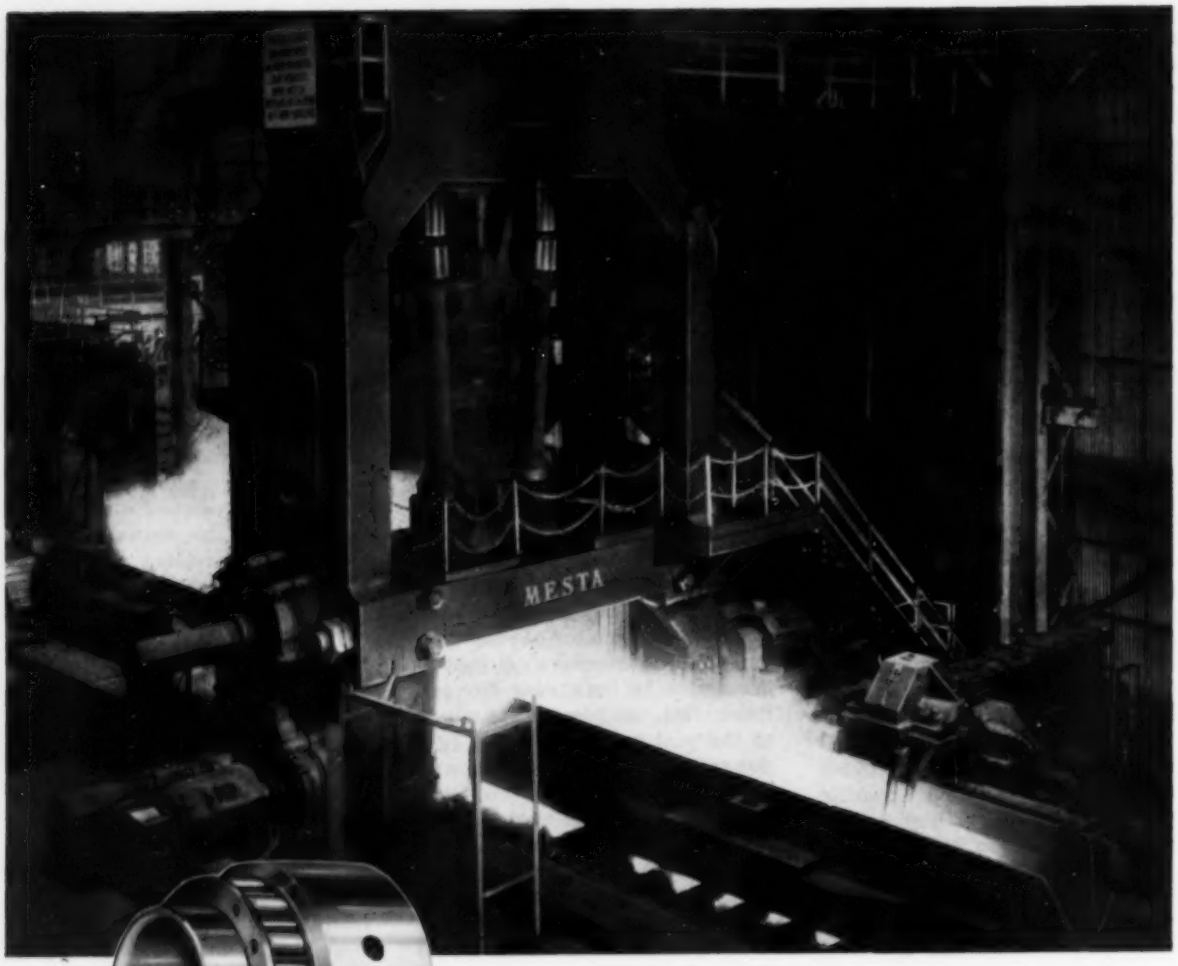

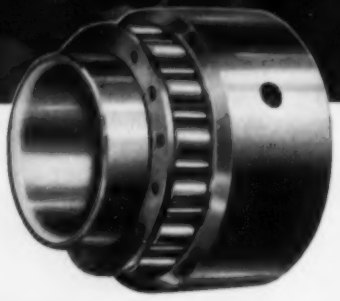

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There's a lot that's new at U. S. Steel's fabulous Fairless Works. New ideas. New techniques. And new equipment . . . like the giant, 45-inch, 16,000-horsepower slabbing mill pictured above.

But one basic construction rule never changes, for steel-makers always protect their investment with *Hyatt* Roller Bearings. At Fairless, Hyatt Bearings are in charging cars, mill motors, ingot cars, cranes, and the bar mill—as well as in the tables and lineshaft of the mighty new slabbing mill.

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HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

GMC's Twin Hydra-Matic unit being assembled (left) at the Willow Run Detroit Transmission Div. plant. After assembly the unit is put on a dynamometer for a complete check (below) which includes adjustment of the shift synchronization

GMC's Shiftless Wonder Gives Truckers a Hand

DETROIT

GMC's latest claim to fame, total shiftlessness, is clinched by a new unit known as Twin Hydra-Matic. To appreciate the significance of the development, here's a glimpse of the truck jockey's problem.

Problem of Economics — Performance, the ability to accelerate or to maintain speed under increasing load, is dependent on power in reserve. In automobiles, the engine size can readily be increased to keep the power-to-weight ratio lively. But to yield performance comparable to that of a 4000-pound car with a 150-hp engine, a modern truck and load of 76,000 pounds, would require a waiting wallop of 2850 hp. Considering the size, weight and fuel requirements of such an engine, it's evident that paying for performance is the short route to economic suicide for the truckers.

That's why the truck transmission problem is to efficiently apply maximum power of a reasonable engine to the rear wheels most of the time. That in turn means plenty of shifting, for although the passenger car normally does not require downshifting until a grade of about 10 per cent is reached, the trucker is reaching for levers when a one-half per cent rise looms.

Problem of Engineering—The problem of making an automatic unit to do this job is as obvious as its benefits. Although the infinitely variable ratio aspects of the torque converter type are theoretically sex appealing, the same slippage lowers mileage and reduces engine braking essential on long downgrades. But only four upshifts with Hydra-Matic offered insufficient automatic flexibility for really heavy-duty stuff.

That's how the Twin Hydra-Matic was born, utilizing two Hydra-Matics synchronized to upshift alternately. Mounted, one inverted over the other to conserve space, power is transmitted from the engine through a special torus member. The efficiency of this torus became a problem in creating creep through the gear leverage at idle, so the unit was equipped with a series of spring-loaded spoilers which are thrown outward by centrifugal force when engine rpm exceeds 700.

Problem of Power—From the torus, power is transmitted by concentric shafts through a planetary differential to the two transmissions permitting them to apportion the load. At the rear of the two Hydra-Matic units is a set of gears which collects the power through an idler transmitting it to a common output shaft.

The upper unit is set through these gears at the back to turn about 25 per cent slower than the lower unit. Each of the units is equipped with its own regular automatic shift control valve, so with the speed differential they shift alternately, lower unit first.

Problem of the Unusual—With

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four ratios per transmission, this gives a total of seven speeds forward occurring in relatively even gear ratio steps, with sixth and seventh being overdrive ratios. To handle unusual situations such as starting on a hill and off the road operation three ranges for the seven automatic shifts are provided. Known as creeper, low and direct, these ranges are provided by a manually shifted synchromesh gear box mounted behind the Twin Hydra-Matic unit.

The THM unit also utilizes a "hold" position on the selector which will lock the Hydra-Matics in the gear engaged for climbing or descending grades. However, on a downgrade should the engine start to over-rev, the transmission will kick up into the next gear. For that reason somewhat greater brake wear may be encountered with THM, but on the other hand there's no clutch to replace.

Problem of Production—Clever as the THM is in operation, perhaps even more striking is the manufacturing savvy that went into its design. Existing tooling for Hydra-Matics is utilized to the extent that the basic procedure in building a THM is to tear down two regular Hydra-Matic units and reassemble them into the new unit. Utilized are the conventional Hydra-Matic cases and a myriad of other parts that would have strait-jacketed GMC in tooling bills. For with a total output thus far of about 150 units and production presently running at 5 units a day, the volume for tooling amortization isn't there.

Among new parts necessary to this unit, however, are special end castings, the differential and linkage gears, and the new torus. A balance pipe is used to equalize the oil supply between the upper and lower units and a few closer tolerances in valve parts are required. The unit has its own special problems in manufacture, too, with the two large end castings required to be within 0.005 inch of parallel over-all to prevent noise and excessive wear.

The Twin Hydra-Matic unit is a small job at Detroit Transmission where 4500 normal units roll off the line every day. Even when production gets rolling it will still be a small volume operation over in a corner. But the men working on these transmissions seem to have more than the usual pride in their work.

"It's like giving a guy another arm," said one. And that pretty well sums it up.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,231	782,491
May		685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,817,821

Week Ended	1954	1953
Apr. 24	157,710	194,610
May 1	159,206	184,800
May 8	154,640	179,621
May 15	153,796	177,805
May 22	157,984	162,447
May 29	156,000*	125,868

Source: Ward's Automotive Reports
*Estimated by STEEL.

Chipless Machining: New Era?

Axle shaft splines are made today by hobbing. This process in most cases requires a cutting time of about two and one-half minutes. Michigan Tool Co. last week announced a new process by which the spline can be rolled in just four seconds, about 36 times faster. Not only is the process quicker, but better surface finish is obtained, the part is improved by pre-stressing, tool life is considerably longer, maintenance is simplified, chip removal is eliminated and the part is readily automated.

The metalworking wonder drug is a new process known as "roto-flo", a cold working technique in which the metal shaft is placed between forming racks similar to broaches in appearance. The axle shaft rotates on its axis as the gear-linked racks pass above and beneath it simultaneously. Since the metal is displaced and not removed, parts are usually made to the pitch diameter before forming. Early tests indicate that parts produced by this technique will withstand higher torsion loads for equivalent shaft sizes than the parts with splines hobbed or shaped from the same material. This is attributed to a better metal structure.

The axle shafts can be rolled with a surface finish of 3 to 6 microinches with an accuracy within 0.0008-inch variation from part-to-part over pins.

It is expected that in the future it will prove possible to extrude the axle shaft and roll the spline on the end without any machining whatsoever, with a complete cycle on the rolling portion of the job running about 10 seconds including load and unload. High tool life is expected since the forming racks undergo compressive stresses rather than shear as with cutting tools.

Instrumental in initiating development of the process was Chevrolet with other auto companies also showing interest more recently.

Car of the Week

Dodge, the "action" car, is doing just about everything but standing on its head in 1954. Its class speed and economy records, stock car racing and even pacing the Indianapolis "500" means there can be little doubt that the Dodge is no longer the teacher's pet personality it once was, hence the advertising and sales action to prove this wagon is now a blonde that can cook.

And cook it does. With a horsepower hike and PowerFlite in 1954, this little color car gets in and digs right on up the clock. Nimble as a ram thanks to its short wheelbase, this car goes from traffic light to traffic light with its head down. On the open road passing torque is particularly good, though the car leans a bit precipitously in harder cornering. Ride is very good, and the steering ratio provides good control.

Interiors are much improved over last year, an area in which there was much room for improvement.

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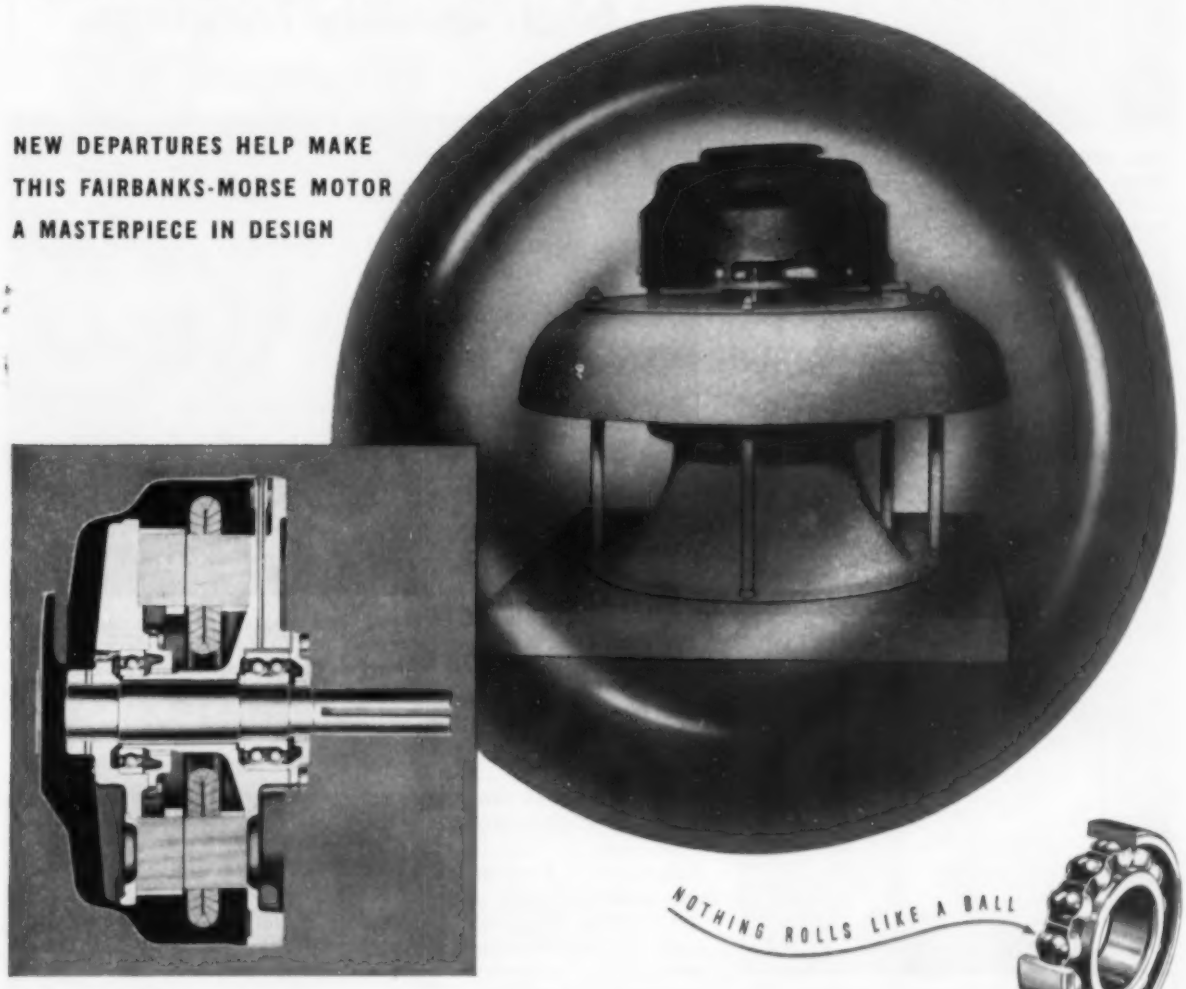
...for Space-Saving, Streamlined Designs!

NEW DEPARTURES HELP MAKE THIS FAIRBANKS-MORSE MOTOR A MASTERPIECE IN DESIGN



NOTHING ROLLS LIKE A BALL

New Departure's angular-contact, preloaded double-row **ball** bearing gives maximum resistance to deflection under *all* load conditions. In the Fairbanks-Morse axial air-gap motor, this bearing assures rigid, permanently accurate support for the rotor. The air gap is maintained with uniformity under *all loads and mounting positions.* Adjustments are never needed—and that means peak motor efficiency *at all times.*

Remember—New Departure is always ready to help with your bearing problems. Talk with your New Departure engineer *now!*

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In Canada: McKinnon Industries, Ltd., St. Catharines, Ontario

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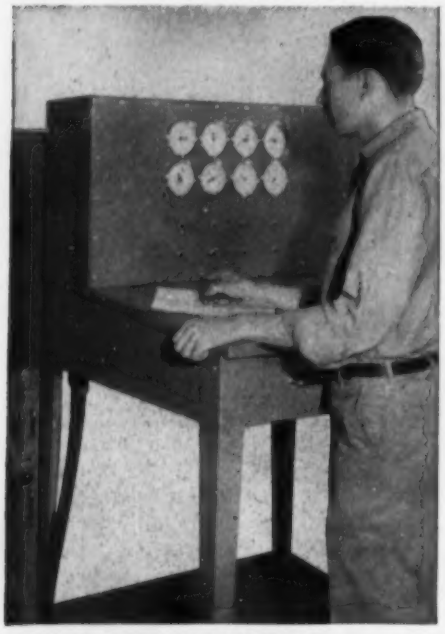
BOSTON	517-A Park Square Bldg.	Hancock 6-9867	**CINCINNATI**	2107 Carew Tower	Main 5783	**MILWAUKEE**	647 W. Virginia St.	Broadway 6-9460
KANNAPOLIS, N. C.	P. O. Box 1086	2-3181	**CLEVELAND**	3113 W. 110th St.	Winston 1-5454	**ST. LOUIS**	3001 Washington Blvd.	Franklin 6533
NEW YORK	1775 Broadway	Circle 6-1540	**INDIANAPOLIS**	1357 W. 18th St.	Imperial 4680	**LOS ANGELES**	5035 Gifford Ave.	Logan 8-2301
PHILADELPHIA	850 E. Luzerne St.	Garfield 3-4136	**PITTSBURGH**	Cathedral Mansions	Mayflower 1-8100	**BERKELEY**	1716 Fourth St.	Landscape 6-8750
SYRACUSE	2360 James St.	73-5195	**CHICAGO**	332 So. Mich. Ave.	Wabash 2-5875	**SEATTLE**	5000 First Ave., S.	Lander 5920
			DAVENPORT	2212 E. 12th St.	Davenport 7-7522			

Why TIMKEN® forging steels give you uniform, high quality forgings

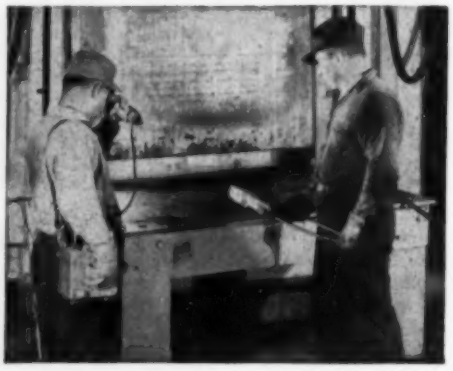
THIS MICROSCOPIC CHECK of your order makes sure that Timken® forging steels have uniform grain size after heat treatment. Result: higher ductility, higher impact. This is another example of the many ways the Timken Company controls quality at every step in production.

INDIVIDUAL HANDLING of your order enables us to target conditioning procedure to your forging requirements. Your forging rejects are minimized. And you save steel because the good dimensional tolerances of Timken bars produce uniform weight multiples with a minimum of steel lost in flashings.



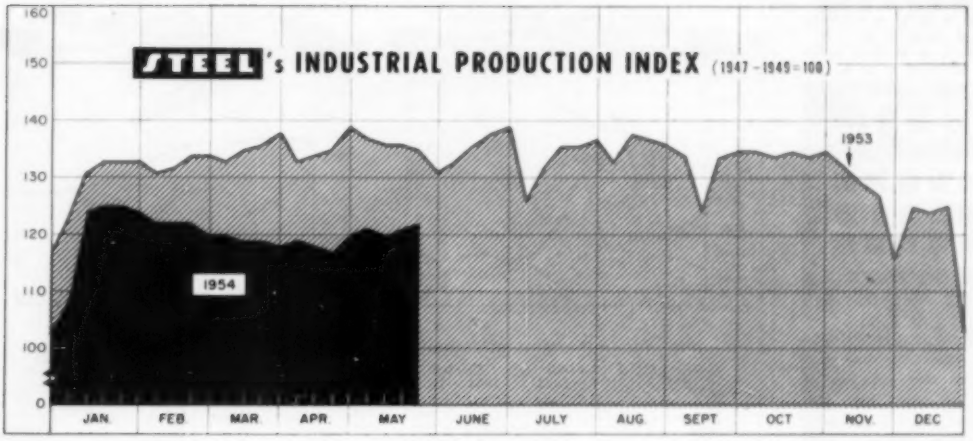
RIGIDLY CONTROLLED CHEMISTRY assures you of uniform composition in every forging bar. This spectrometer, for example, tells the exact composition of a melt in just 40 seconds. Results are flashed back to the furnace so the melter can maintain constant control of the heat analysis.

YOU HAVE FEWER FURNACE ADJUSTMENTS when you use Timken forging steels. Every lot responds uniformly to heat treatment because every lot has the same physical and chemical properties. Always specify Timken forging steels. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".



YEARS AHEAD — THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



* Week ended May 22

Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%

Production Index Reaches Three-Month High

ACTIVITY in the business world is beginning to pick up, and STEEL's industrial production index reflects the moderate increase with a preliminary reading for the week ended May 22 of 122 (1947-1949 = 100). How much of an upturn it will be or how long it will last are unknown variables. But after waiting since last fall for the swing to come, it may be short-lived. We are now entering the period when the normal summer slump starts.

At any rate, STEEL's index is at the highest point since Feb. 20, and some pretty positive factors may keep it up there for a while, at least. Steel operations have been climbing slowly past the 70-percent-of-capacity mark for three straight weeks. Actual operations for the week ended May 16 as reported by American Iron & Steel Institute were 70.9 per cent, followed the next week by 71.8 per cent. The institute predicted an operating rate of 70.5 per cent of capacity for the week ended May 30. At that rate, the industry would pour 1,680,000 tons of steel for ingots and castings.

Insurance—Steel orders are becoming more frequent as the spring turns to summer and steel wage talks arrive. The demands of the union were more than many businessmen had anticipated, thus taking a little of the edge off the "no strike" optimism which has fostered ordering close to the cuff. Few people actually expect an industrywide strike this year, but just as few would bet their last 10 days' inventory against the possibility. It may be just enough of a scare to produce some noticeable results on the steel order books.

Another reason for the show of strength in the indicators is the uptrend in loading of revenue freight. Association of American Railroads reports that for the week ended May 15, 677,581 freight cars were loaded. That continues a rise which began in the second

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,668	1,690	2,250
Electric Power Distributed (million kwhr)	8,420[1]	8,380	8,013
Bitum. Coal Output (daily av.—1000 tons)	1,186	1,129	1,518
Petroleum Production (daily av.—1000 bbls)	6,450[1]	6,428	6,360
Construction Volume (ENR—millions)	$330.4	$344.0	$282.2
Automobile, Truck Output (Ward's—units)	157,984	153,796	162,447
TRADE			
Freight Car Loadings (unit—1000 cars)	680[1]	678	770
Business Failures (Dun & Bradstreet, no.)	225[1]	248	156
Currency in Circulation (millions)[3]	$29,707	$29,759	$29,795
Dept. Store Sales (changes from year ago)[2]	−8%	−4%	+7%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,770	$17,858	$18,304
Federal Gross Debt (billions)	$273.2	$271.0	$265.8
Bond Volume, NYSE (millions)	$20,833	$17,000	$14,819
Stocks Sales, NYSE (thousands of shares)	11,151	10,098	6,834
Loans and Investments (billions)[4]	$79.7	$79.9	$75.8
U. S. Gov't Obligations Held (billions)[4]	$32.0	$32.4	$29.0
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	212.6	212.6	223.3
All Commodities[7]	111.3	111.0	109.9
Commodities Other Than Farm & Foods[7]	114.4	114.4	113.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,540. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939 = 100. [6]1936-1939 = 100. [7]Bureau of Labor Statistics Index, 1947-1949 = 100.

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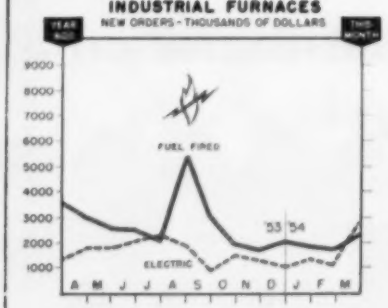
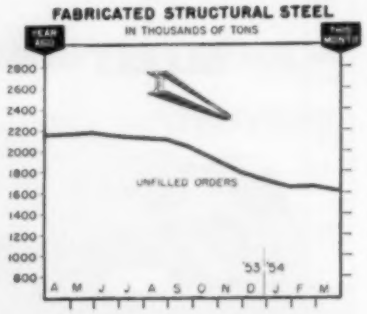


New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1954	1953	1954	1953
Jan.	1,865	3,540	1,374	1,655
Feb.	1,758	3,996	1,093	1,672
Mar.	2,346	3,607	2,828	1,301
Apr.	....	3,017	....	1,796
May	....	2,609	....	1,799
June	....	2,550	....	2,095
July	....	2,017	....	2,246
Aug.	....	5,465	....	1,904
Sept.	....	3,019	....	873
Oct.	....	1,975	....	1,539
Nov.	....	1,692	....	1,256
Dec.	....	2,013	....	1,014

*Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.



Thousands of Net Tons

	Shipments		Backlogs	
	1954	1953	1954	1953
Jan.	245.6	241.4	1,686	2,180
Feb.	253.1	251.1	1,697	2,128
Mar.	285.4	266.3	1,645	2,155
Apr.	....	263.2	....	2,168
May	....	263.8	....	2,179
June	....	274.6	....	2,153
July	....	230.3	....	2,134
Aug.	....	251.1	....	2,122
Sept.	....	255.6	....	2,041
Oct.	....	295.5	....	1,927
Nov.	....	257.8	....	1,804
Dec.	....	266.9	....	1,741
Total	....	3,117.6		

American Institute of Steel Construction.

Charts Copyright 1954 STEEL.

week of April and marks the best report since the first week in December. Reports from the East say that the better business has pried loose some railroad orders for more steel for rails, bridge construction and the like.

Steady as You Go . . .

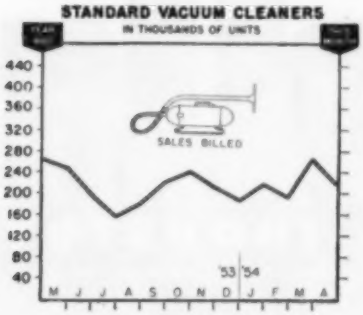
The other two factors in STEEL's index which have been holding it up in the last two months continue to do so. Auto output advanced a notch or two for the week ended May 22 when 148,835 cars and trucks hit the roads to the dealers' showrooms, according to *Ward's Automotive Reports*. The previous week's figure was 143,629. Autos made the entire difference as truck production reflected the hard time dealers are having with current stocks. Electricity, the other steady element, continues to run ahead of year-ago figures by 5 to 6 per cent.

The Amazing Jalopies . . .

The used-car market continues to amaze automen, especially considering how loose it was less than a year ago. *Ward's* says that sales reached an eight-month high in April and shoved used-car stocks to a six-month low by May 10. On the basis of early May sales, the present supply is slightly above the 27-day level. In the meantime, new-car dealers still have record high stocks, but *Ward's* says there is some argument that more than a 30-day inventory should be considered normal in view of the demands of a competitive market.

Sky's the Limit . . .

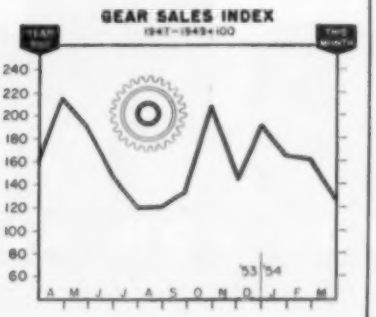
If there is a ceiling on construction, most persons in the industry either don't know it or they feel it hasn't been reached yet. *Engineering News-Record* reports that housing contracts totaled $117.7-million for the week ended May 20, bringing the year's total to $1660.1 million, 3 percent above the high in 1953. A recent survey of private housing starts indicates that April starts were the highest in 3½ years, and the trend is continuing. F. W. Dodge Corp. reports that future school construction in the 37 eastern states also is sparking the boom with new records far above last year's levels. In 1946, school construction accounted for only 4 per cent of nonresidential contract awards and 1 per cent of all awards. Now they account for 26 per cent of nonresidential and 9 per cent of total



Sales Billed—Units

	1954	1953	1952
Jan.	221,233	255,886	223,357
Feb.	199,035	246,007	230,226
Mar.	276,464	329,294	290,092
Apr.	220,849	268,548	217,169
May	.....	252,404	216,969
June	.....	197,506	206,939
July	.....	159,446	188,715
Aug.	.....	188,536	222,413
Sept.	.....	227,253	237,541
Oct.	.....	249,383	292,474
Nov.	.....	216,227	254,297
Dec.	.....	190,773	249,632
Total	.....	2,781,263	2,841,803

Vacuum Cleaner Mfrs. Assn.



	1954	1953	1952
Jan.	167.4	161.4	670.6*
Feb.	165.1	188.1	539.5*
Mar.	128.6	158.9	517.1*
Apr.	.....	217.1	478.7*
May	.....	189.8	425.9*
June	.....	146.5	452.3*
July	.....	120.7	145.3
Aug.	.....	121.6	132.3
Sept.	.....	135.6	143.4
Oct.	.....	211.1	160.8
Nov.	.....	144.9	150.9
Dec.	.....	194.0	140.9

*(1935-1939=100)
American Gear Manufacturers Assn.

construction awards. The recent antisegregation decision of the Supreme Court is expected to boost this type of building even higher.

More Up than Down . . .

The May survey of the National Association of Purchasing Agents is the third in a row in which reports of increases in orders and production outnumber the decreases. In fact this latest study shows the lowest number reporting decreases since last June. As in the past few reports, inventories are still decreasing but at much slower pace. At the same time, more PAs report additions to stocks than a month ago. The general rule still seems to be to play it close to the chest, however, and probably will remain so as long as most materials are in easy supply.

Machine Tools Down Again . . .

National Machine Tool Builders' Association reports that the preliminary index for new orders in April fell to 142.6 (1945-1947=100), the lowest mark since June, 1950. Although the index generally has been falling steadily for more than a year, this is the sharpest drop since last October. The ratio of unfilled orders to demonstrated production rate is now 4.1 to 1, the lowest since February, 1950.

Business Aplenty . . .

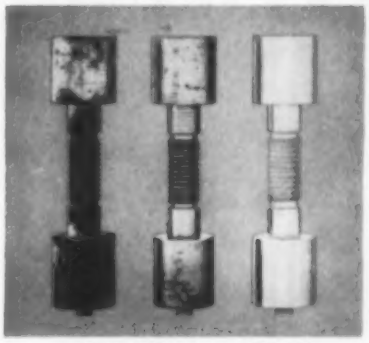
The number of business establishments continues to rise as Dun & Bradstreet Inc. reports 10,272 incorporations in April against 975 failures. The number of new companies was the highest for that month since 1947, but it was 2.3 per cent below the March figure. The number of failures declined 21 per cent from March, but it was still 41 per cent ahead of April, 1953.

Trends Fore and Aft . . .

Kennecott Copper Corp. has called about 450 men back to work at its Utah Copper Division since it began a six-day work week with no overtime to replace the five-day week with overtime . . . Philco Radio Corp. reports it has had to produce a larger quantity of lower-priced TV sets this year to meet the competitive situation . . . American Motors Corp. declared its initial dividend of 12½ cents, just half the amount paid by Nash and Hudson before the merger.

NEW WAY TO STOP RUST

Easily! Quickly! Without Slushing!



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Look at these steel samples—they tell the story. After 3 years of unsheltered storage outdoors in an industrial marine atmosphere, only the VPI wrapped sample on the right is still bright and clean. The untreated sample on the left was wrapped in plain kraft, the middle one treated with a good rust-preventive oil and wrapped in Grade A barrier material. All were overwrapped with kraft-asphalt paper.

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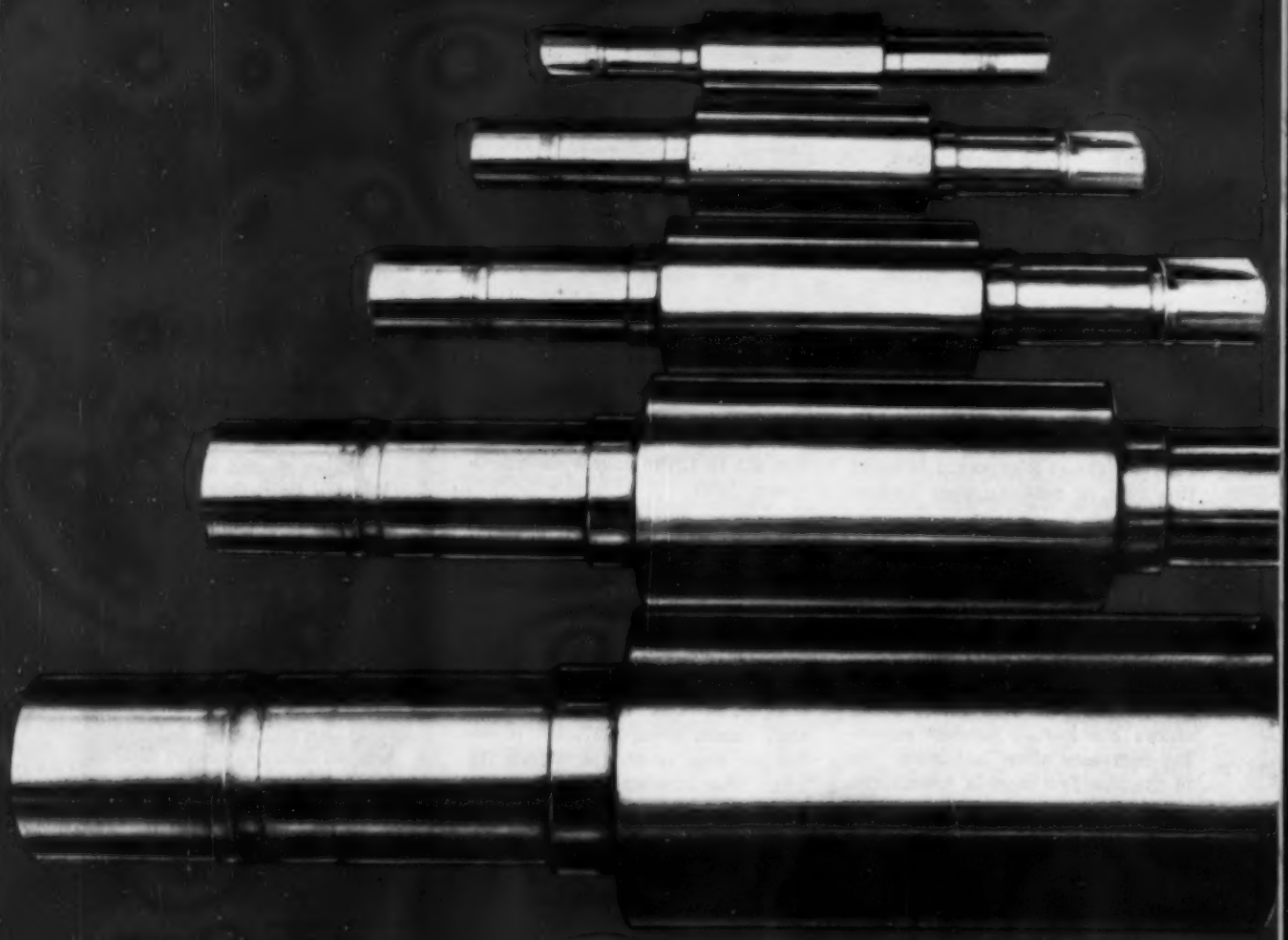

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LIMA, OHIO • Plants at Lima and Springfield, Ohio

JAMES M. DARBAKER
. . . senior v. p. at Copperweld Steel

T. R. DREYER
. . . AMF's manufacturing div. v. p.

J. L. PISCHKE
. . . new president of American MonoRail

James M. Darbaker was appointed senior vice president of **Copperweld Steel Co.** He also was elected to the board of directors. Mr. Darbaker will have headquarters in the executive offices at Pittsburgh. He has held various administrative, production and sales positions with U. S. Steel Corp. for over 34 years.

T. G. A. Sillers was promoted to chief engineer of the switchgear department, **Allis-Chalmers Mfg. Co.**, Milwaukee. He succeeds **L. J. Linde**, recently named director of electrical engineering for the general machinery division. Mr. Sillers continues headquarters at the firm's Hawley Works, West Allis, Wis. **J. F. Chipman** was made assistant chief engineer of the switchgear department and continues location at the Boston Works.

Gas Atmospheres Inc., Cleveland, named **William Barstow** assistant sales manager and **William Marquardt** assistant chief engineer. **John Vance** was made sales engineer for the eastern district.

O. E. Williams was named research and design engineer, tool division, **Bonney Forge & Tool Works**, Allentown, Pa.

Woodrow W. Carpenter was made director of research for **Barrows Porcelain Enamel Co.**, Cincinnati.

T. R. Dreyer was made divisional vice president and general manager of **American Machine & Foundry Co.'s** manufacturing division. Last October he was named director of manufacturing of the five AMF plants located in Buffalo, Boston, Glen Rock, Pa., New Haven, Conn., and Brooklyn, N. Y. **Brig. Gen. Oscar J. Gatchell**, U.S.A. (ret.), was named technical assistant to the vice president in charge of engineering.

Globe Steel Tubes Co., Milwaukee, appointed **G. H. Krohn** Chicago district sales manager to succeed the late **J. W. Floto. C. A. Schroeder** replaces Mr. Krohn at Milwaukee as manager of sales, stainless tubing. **J. J. Lukens** will be manager of the Cleveland office.

Lincoln Park Industries Inc., Lincoln Park, Mich., appointed **John Delaney** vice president and factory manager and **Robert G. Field** sales manager and administrative assistant.

Peerless Steel Equipment Co., Philadelphia, elected **Anton J. Kuhn** president to succeed the late **George Bergmann; Conrad Bergmann** vice president, **F. E. Timlin** secretary-treasurer, **A. F. Rosenberger** vice president-production, **H. Wray Crane** vice president-sales and **A. H. Kappenberger** assistant secretary.

J. L. Pischke was elected president, **American MonoRail Co.**, Cleveland, to succeed **J. P. Lawrence**, now chairman of the board. With MonoRail since 1936, Mr. Pischke has served successively as auditor, secretary, treasurer and since 1951 as executive vice president. Filling newly created vacancies on the board of directors are **C. L. Fell**, sales manager of the textile division, and **Carl Harris**, vice president of production.

Fred C. Linge fills a new position of production and process engineer at **Republic Steel Corp.'s** strip mill, Cleveland. **Arthur E. Engstrom** was made manager of the production and order department, Cleveland district, and **Edward J. Healy Jr.** will be assistant manager of that department for the strip mill.

Diversey Corp., Chicago, named **R. J. Stell** to the newly created post of manager, new product development; **C. R. Reid** to assistant general sales manager; **E. M. Petrie** to manager of the technical service department; **M. J. Butler Jr.** advertising-sales promotion manager; and **H. M. Pickles Jr.** assistant to vice president-sales.

W. L. Ashlock and **H. F. Grote** were made regional sales managers for the metals division of **Olin Industries Inc.** Mr. Ashlock is lo-

HOWARD J. WARNKEN

NELSON H. MAGEOCH

. . . vice presidents of Daystrom Instrument Division

cated at the New Haven, Conn., plant and Mr. Grote at Cleveland.

Howard J. Warnken and **Nelson H. Mageoch** were elected vice presidents of **Daystrom Instrument Division**, Daystrom Inc., at Archbald, Pa. Mr. Warnken in his new capacity continues direction of contract negotiations between Daystrom Instrument and the armed forces as well as the company's sales program for private industry contracts. Mr. Mageoch continues to direct engineering and research activities at the Archbald plant, together with industrial engineering, equipment installation, inspection and test, and the firm's pilot plant operation.

Samuel J. Clokey was made assistant vice president-sales, **Jessop Steel Co.**, Washington, Pa.

N. C. Gianakos was appointed assistant general sales manager, **Virginia Metal Products Inc.**, Orange, Va. He was manager of production planning.

E. G. Fenton was elected vice president in charge of operations, **Empire Steel Corp.**, Mansfield, O. He joined the company in 1951 and in 1953 became works manager.

James Bere was made assistant general manager at **Clearing Machine Corp.'s** Hamilton, O., plant.

American Zinc, Lead & Smelting Co., St. Louis, announces that **Howard L. Young** was made a vice president of its subsidiary companies, American Zinc Sales Co. and American Zinc Oxide Co.

General Steel Castings Corp., Granite City, Ill., elected **Howard F. Park Jr.** vice president-sales, **J. Harvey Johnston** vice president, **R. T. Risk** treasurer and **G. K. Hoblitzelle** secretary.

Link-Belt Co. appointed **Donald L. Shirley** Seattle district sales manager.

Kenneth W. Cunningham, general manager of production, and **Jerry G. Pritz**, general sales manager, were elected vice presidents of **Ohio Ferro-Alloys Corp.**, Canton, O.

Lawrence C. Connolly was made manager of the Boston sales office of **Fielden Instrument Division**, Robertshaw-Fulton Controls Co.

At **Republic Steel Corp.'s** Youngstown district steel plant **Joseph G. Keller** was named district industrial engineer to succeed **O. G. Robertson**, resigned. **John C. Talbott** replaces Mr. Keller as assistant district industrial engineer.

Bliss & Laughlin Inc. appointed **Charles H. Scott** district sales manager, Detroit office, and employed **Vern G. Mandeville** as a salesman to work out of that office.

Charles W. Yutmeyer was made superintendent, electric melting department, at the Midland, Pa., Works of **Crucible Steel Co. of America.**

H. Monteith Albers, vice president, **Kensington Steel Co.**, Chicago, was elected to the board and appointed to the executive committee.

J. W. Marrinan was made assistant general manager of operations for **Superior Steel Corp.**, Pittsburgh. Prior to joining Superior, he was vice president in charge of operations for A. M. Byers Co.

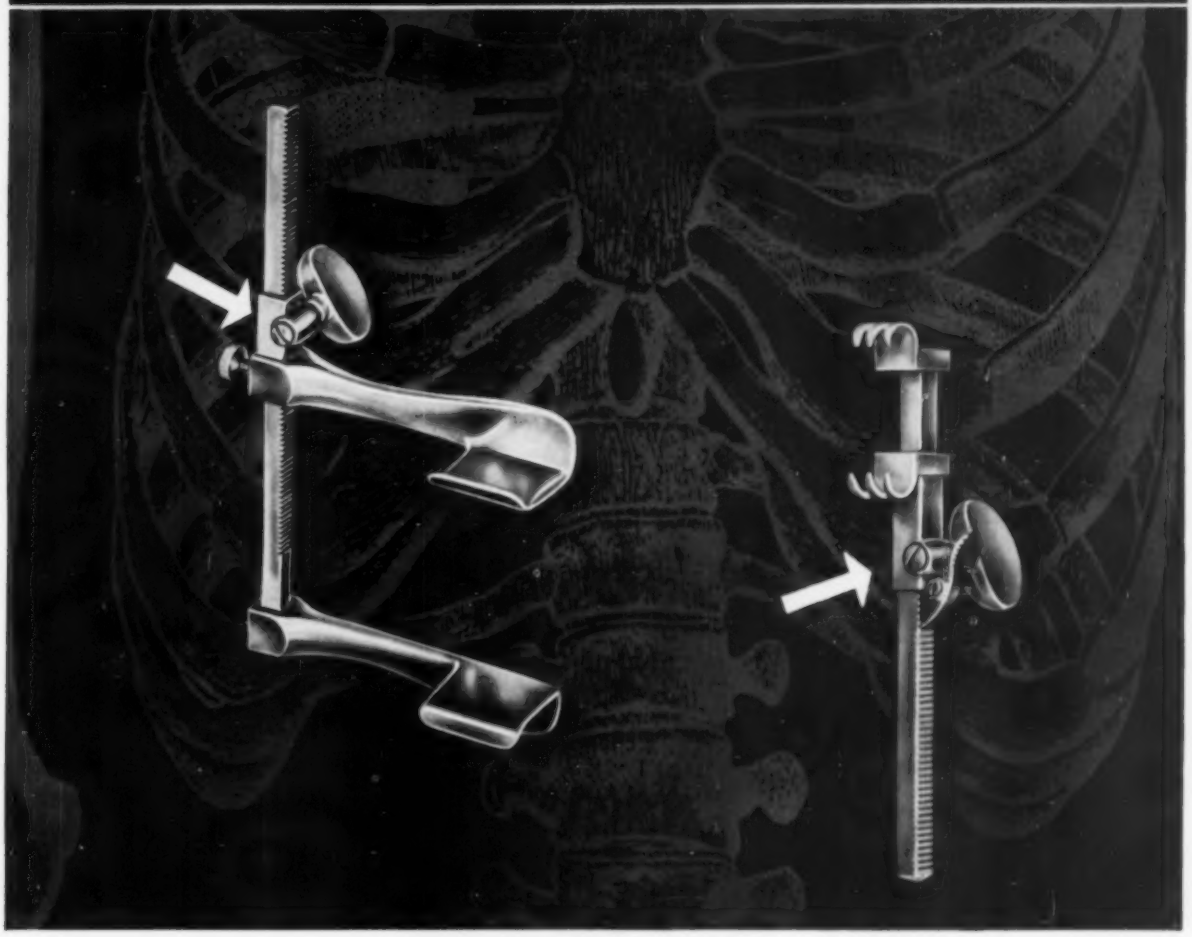
Ralph L. Leadbetter was elected president, **Burgess-Manning Co.**,

KENNETH W. CUNNINGHAM

JERRY G. PRITZ

. . . named vice presidents of Ohio Ferro-Alloys

How to simplify a moving problem



It's a safe bet you've never met these two devices before. On the left is a Tuffier Rib Retractor; on the right, a Bailey Rib Contractor. Both are made by George P. Pilling & Son Co., famed surgical instrument makers of Philadelphia.

The retractor is used by the surgeon to move ribs apart; the contractor to move ribs back to normal position after an operation.

Among the many problems that cropped up in the construction of these instruments was the design of the pinion rod supports (arrows) that slide on the square racks. One solution was to broach a square hole in bar stock, but the cost was high.

Pilling discovered Superior could draw square tubing from type 304 stainless steel to the close I.D. tolerance they required. Superior stainless steel tubing resists corrosion, has no plating to wear off, silver-solders without difficulty.

Superior square tubing is only one of a wide variety of round and shaped tubing made by Superior in up to 55 analyses. And every length or coil of Superior tubing is backed by Superior tubemanship—production and research that make a real difference when you're in a jam. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

Round and Shaped Tubing Available in Carbon, Alloy, and Stainless Steels; Nickel and Nickel Alloys; Beryllium Copper; Titanium; Zirconium.

Superior

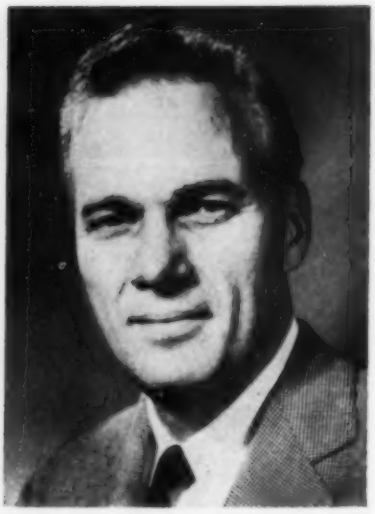
THE BIG NAME IN SMALL TUBING

All analyses .010" to ⅝" O.D.
Certain analyses in Light Walls up to 2½"

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif., RAymond 3-1331

JOEL HUNTER
. . . president of Crucible Steel

PAUL W. POLK
. . . heads Threadwell Tap & Die



ROBERT M. NORTON
. . . Hanson-Van Winkle-Munning v. p.

Libertyville, Ill., to succeed **Willis L. Manning** who retains the positions of treasurer and a director.

Joel Hunter succeeds **William H. Colvin** as president of **Crucible Steel Co. of America**, Pittsburgh. Mr. Colvin, retiring from active business life, continues as a member of the executive committee and as a director. Mr. Hunter joined Crucible in 1951 as vice president-finance and was elected a director and executive vice president in 1953.

John L. Worrilow, formerly assistant to the president, **Lebanon Steel Foundry**, Lebanon, Pa., was elected secretary. He succeeds **Harry L. Quinn** who continues as general manager.

Charles D. Allis was made assistant general sales manager, **McCulloch Motors Corp.**, Los Angeles.

G. W. Stanley Jr. was made manager of Pressed Steel Car Co. Inc.'s **Solar-Sturges Mfg. Division**, Melrose Park, Ill.

Paul W. Polk was elected president, **Threadwell Tap & Die Co.**, Greenfield, Mass., subsidiary of Sheffield Corp. A vice president of Sheffield, he was made vice president and manager of Threadwell when it was acquired in 1946.

Lindberg Engineering Co., Chicago, appointed **L. H. Remiker** to head up its newly formed field-erected equipment division.

Herbert Barto, former purchasing agent for Rodale Mfg. Co. Inc., has joined the sales force of **Globe Bolt & Screw Co.**, New York.

Darrell Simpson was promoted to manager of purchases, **Deepfreeze Appliance Division**, Motor Products Corp., Chicago. He succeeds **H. W. Bartley**, resigned.

Michael Kramcsak Jr. was made chief of engineering at **Bassick Co.**, Bridgeport, Conn. With the company since 1934, he made many contributions in design and development of new and improved products in the company's line.

Hanson-Van Winkle-Munning Co., Matawan, N. J., appointed **Robert M. Norton** vice president and **Myron B. Diggin** assistant vice president. Both continue responsibilities as sales manager and technical director, respectively.

Cleveland Instrument Co., Cleveland, appointed **Robert A. Manes** as vice president to head up its expanding sales activities on precision dimensional gaging equipment.

George J. Ficken Jr. was made assistant general sales manager, **Russell, Burdsall & Ward Bolt & Nut Co.**, Port Chester, N. Y.

William M. Wallace was made assistant manager, power department, in **Allis-Chalmers Mfg. Co.'s** general machinery division, Milwaukee.

Turner A. McMullen was made vice president of **Bingham-Herbrand Corp.**, Toledo, O., and general manager of the Herbrand and Aviation Divisions, Fremont, O.

OBITUARIES . . .

Henry D. Sharpe, 81, chairman and former president of **Brown & Sharpe Mfg. Co.**, Providence, R. I., died May 17.

Daniel C. Reagan, purchasing agent, **Ohio Seamless Tube Division**, Copperweld Steel Co., Shelby, O., died Apr. 23.

Frederick B. Hufnagel, 75, one-time chairman and president of **Crucible Steel Co. of America**, Pittsburgh, died May 16.

Robert J. Morrow, 65, vice president, **Canadian Laundry Machinery Co.**, Toronto, Ont., died May 11.

Arthur J. Westphal, vice president of sales and secretary, **Atlas Steel Casting Co.**, Buffalo, died May 11.

Howard C. McNeil, 76, president, **Illinois Iron & Bolt Co.**, Carpentersville, Ill., died May 14.

Rollin S. Thompson, 54, sales manager, **Automatic Spring Coiling Co.**, Chicago, died May 12.

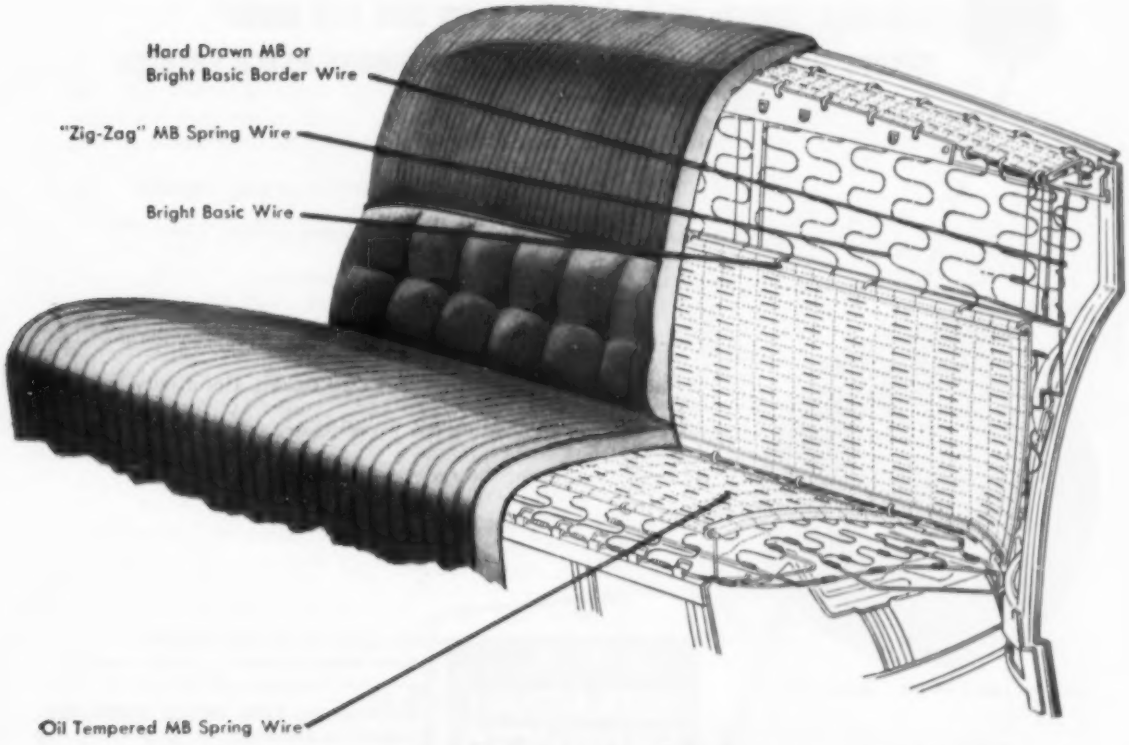
riding comfort starts with

Wickwire Wire

New types of spring construction for seat and back cushions add immeasurably to the smooth, easy-riding comfort of today's automobiles.

Here again, as in so many other instances, the complete range of Wickwire Wire—high or low carbon, in all tempers, finishes and grades—provides exactly the right kind of wire for all parts of the complete spring assembly.

Good reason why Wickwire Wire is selected for the cushion spring units on many of America's leading makes of cars. Good reason, too, why it will pay you to remember—For The Wire You Require; Check First With Wickwire.



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THE COLORADO FUEL AND IRON CORPORATION

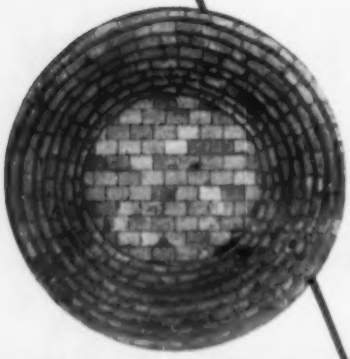
2014

A. P. GREEN
KX-99

KX-99 firebrick linings in hot metal cars and hot metal mixers provide extra tonnage that means extra savings

The superior toughness and uniformity of KX-99 in hot metal car and hot metal mixer linings has provided such outstanding service records, many leading steel companies have standardized on their use.

The exceptional properties of KX-99 brick enable them to better withstand erosion and slag action. Uniformity of size permits laying up KX-99 with very thin joints to better withstand the scouring and washing action of molten metal.



KX-99 LINING IN HOT METAL CAR.

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REFRACTORY PRODUCTS
SERVE THE WORLD'S INDUSTRIES

For detailed information on service and specific recommendations—contact your local A. P. Green Representative or write

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A. P. GREEN FIRE BRICK COMPANY, LTD.
TORONTO 15, ONTARIO

(*Concluded from page 59*)

port development programs.

The Cities Alerted—At Cleveland, for example, a consultant is to be employed to determine the city's needs in seizing the commercial opportunities. A survey will be made to determine volume and character of water-borne traffic in prospect; marine terminal and warehousing facilities now available and needed to accommodate enlarged traffic; prospects for developing waterfront and water-based industry and areas that can be reserved for such use; master guide plans for the physical, financial, promotional and administrative development of the waterfront; interim action, pending completion of the seaway, to improve port utility and maintain or expand the area's competitive position.

Private business is moving, too, to develop programs that will jibe with government's. Backers of the dormant $210-million Cleveland-to-East Liverpool, O., conveyor belt project, for example, are again pushing the proposal as an auxiliary service in the over-all seaway program.

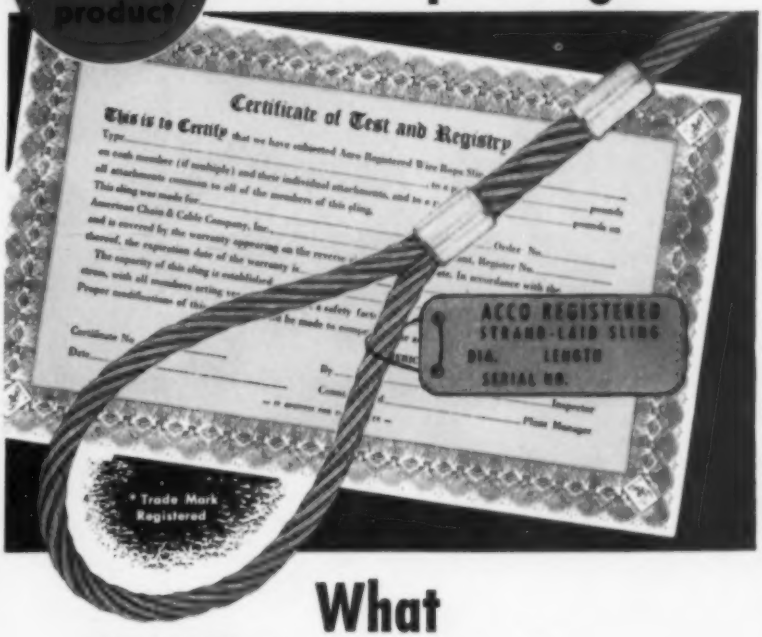
Rounded Project—Backers say that to build the seaway and not add the conveyor belt would be like building a house without a driveway. This 103-mile ore and coal carrying belt failed to obtain right-of-way rights in several attempts over recent years. Ore delivered from Labrador could be moved south to the steel mills on the belt, while coal would move north to lake ports brought within easy reach of the seaway.

Import of all this is that government and private business in the Great Lakes area are alive to the tremendous commercial opportunities bound to follow in the wake of the seaway completion, and they are starting to do something about it. It is obvious, however, that completion of the project in its fullest sense is a great many more years distant than the six or seven predicted for the seaway as just authorized by Congress for joint construction with Canada.

Watch for part three in next week's issue.

an ACCO product

ACCO Registered* Wire Rope Slings



What ACCO Registered Means

• Primarily it means greater safety for your men and machines when loads are carried in the air in your shop. It means insurance against dropping a load which could tie up production.

But that's only part of the story. The name ACCO *Registered* on the slings you use means greater efficiency because of better design of endings and attachments. It means lower overall sling costs because every part of every ACCO *Registered* Wire Rope Sling has the same strength as the catalog breaking strength of the rope itself. ACCO even magnafluxes each hook to make doubly sure it will serve you well.

And it means that the sling has been proof-tested at the factory to twice its rated capacity. You can be sure that every ACCO *Registered* Wire Rope Sling is the safest, strongest and lowest cost lifting tool you have ever used.

Best of all, you can get them when you need them from a nearby stock. Contact your ACCO *Registered* distributor today for full information and prices. Or, write our Wilkes-Barre, Pa., office.

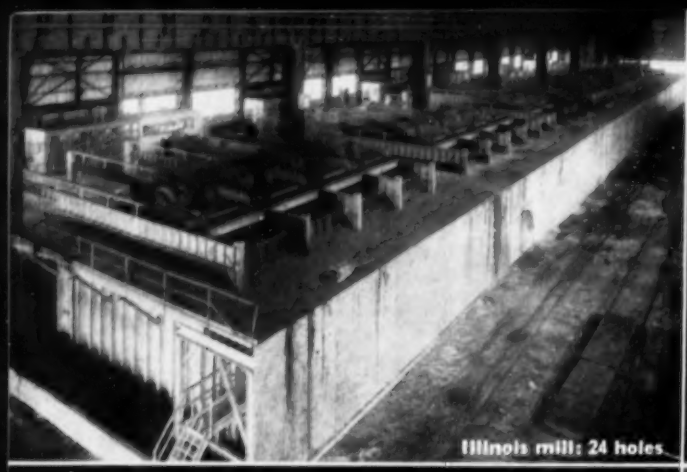
1 The best material
2 Unit safety factor (on bodies, rings, links, safety shackles, hooks)
3 Proof test of complete sling to twice rated capacity
4 Actual field service test of each model
5 Metal identification tag on each sling
6 Signed Registry Certificate with each sling

ACCO
TRADE MARK

Wire Rope Sling Department
AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn. • In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.

plus Links Shackles Hooks



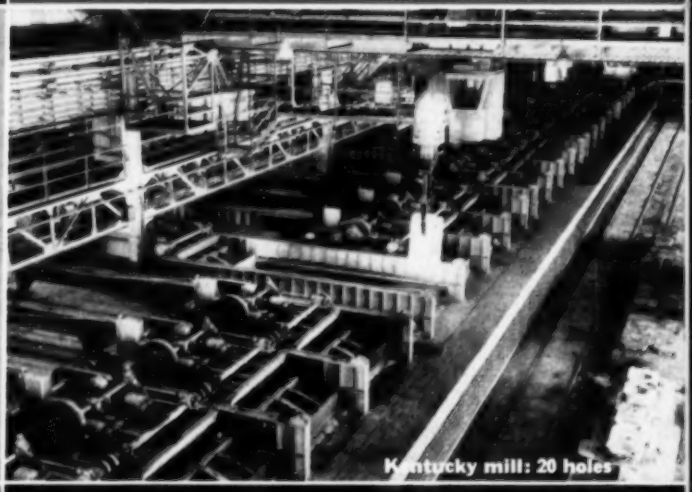
Illinois mill: 24 holes

Illinois mill: 12 holes

271 HOLES

In the steel industry's current modernization program, Surface Combustion has installed 271 one-way fired soaking pits, with a capacity of 20 million tons a year. That's nearly 90% of the pits built since World War II. We believe there is a simple explanation for these facts: Surface Combustion is known for the quality of engineering that developed the jet pump recuperative system and for the experience gained in almost 50 years of working with steelmakers. 'Surface' means equipment that performs up to the customer's requirements, or better.

SURFACE COMBUSTION CORP.
Toledo I, Ohio



Kentucky mill: 20 holes

Michigan mill: 20 holes

Pennsylvania mill: 15 holes

New York mill: 16 holes

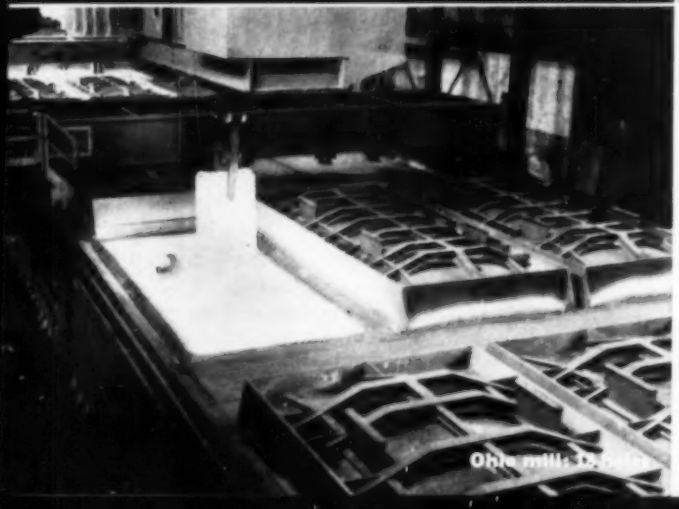
Pennsylvania mill: 16 holes

Pennsylvania mill: 30 holes

IN 7 YEARS

20 MILLION TONS YR.

Mexican mill: 6 holes



Ohio mill: [illegible]

Surface

STEEL MILL FURNACES

Form Firth-Loach Metals

Pittburgh firm will make cemented carbides for the tool and die industry

CEMENTED CARBIDES for the tool and die industry will be manufactured by a newly organized company, Firth-Loach Metals Inc. It was incorporated for $1,250,000 by L. Gerald Firth, president; William J. Loach and Charles E. Young.

The company established headquarters in the Union Trust building, Pittsburgh, and will operate a plant situated on Buttermilk Hollow road, West Mifflin borough, Pennsylvania. Initial operations will be at the rate of a sales value of about $1 million a year in the form of tips for cutting tools and inserts for drawing, blanking and heading dies. The management expects that this will be increased substantially during the next few years.

Fall Opening—Alterations to the building, the former Ammerman cleaning plant, and the installation of equipment will begin in June and first operations are expected in September.

The company will specialize on the production of carbide metal itself which will be sold to the numerous tool and die makers for manufacture into finished tools and dies. A strong demand is anticipated since the use of carbide has increased many times during the last ten years. This rate of increase shows no sign of diminishing, company officials say.

Intensifies Titanium Research

Mars Engineering & Mfg. Co., Burbank, Calif., is opening a long-range titanium research and development program dealing with fabrication methods and applications of titanium metals.

Weirton To Get More Power

Work on relocation and enlargement of an electrical substation in the sheet mill yard of Weirton Steel Co., Weirton, W. Va., a division of National Steel Corp., Pittsburgh, will be completed about July 1. Additional equipment to be installed will increase transformer capacity by 60,000 kva, making capacity of the new substation 90,000 kva. The increase is to take care of the additional electrical load being created by improvements in the strip steel department.

Los Angeles Firm Changes Name

Firm of H. W. Twogood, Los Angeles, changed its name to Wheel Trueing Tool Co. of California. The company offers a complete line of industrial diamond products. Facilities will be expanded.

Deery Heads Brinton Foundry

Brinton Foundry Inc., Philadelphia, is operating under separate management. It was operated formerly as a subsidiary of H. Brinton Co., that city. John F. Deery is president of the foundry, which has been completely modernized within the last year.

Conveyor Firm To Expand

Hohl Machine & Conveyor Co. Inc., Buffalo, plans to build a 22,000-sq-ft plant costing about $200,000. Machinery costing $200,000 or more will be installed. The firm makes materials handling equipment.

Offers Plated Fine Wire

Plated fine wire for electronics and instrumentation applications is now being marketed by North American Research Laboratories Inc., Kenilworth, N. J. Company specializes in continuous wire and strip plating and precious metal plating of small parts.

Renner Mfg. Erecting Plant

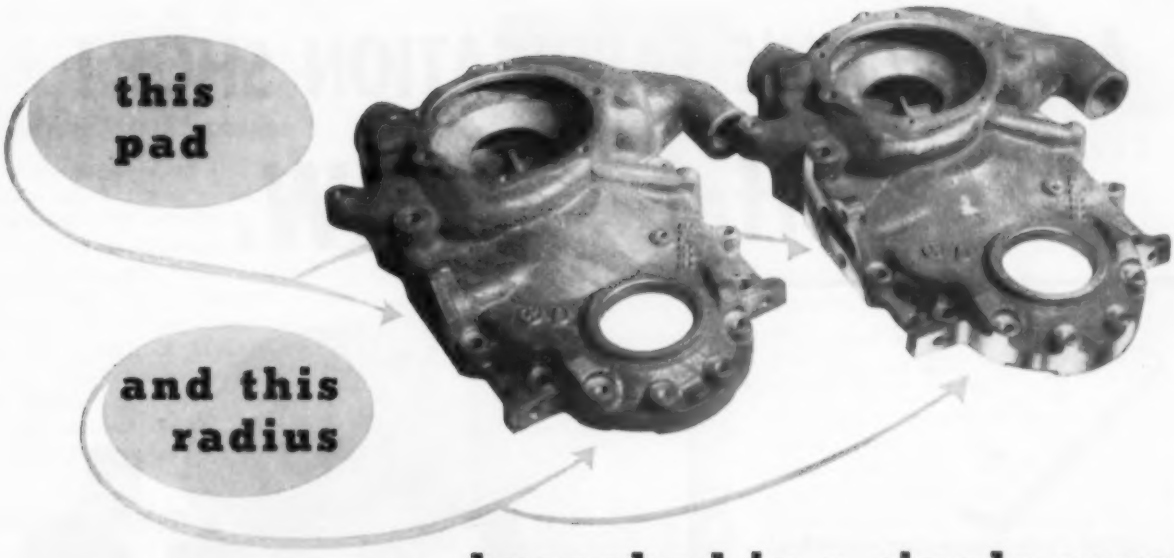
Renner Mfg. Co. is building a $250,000 plant at N. 124th street and W. Hampton avenue, Milwaukee. Additional equipment will be acquired to enlarge the scope of its manufacturing operations. The firm supplies heavy industry with fabricated metal parts.

Forms Cleveland Casting Firm

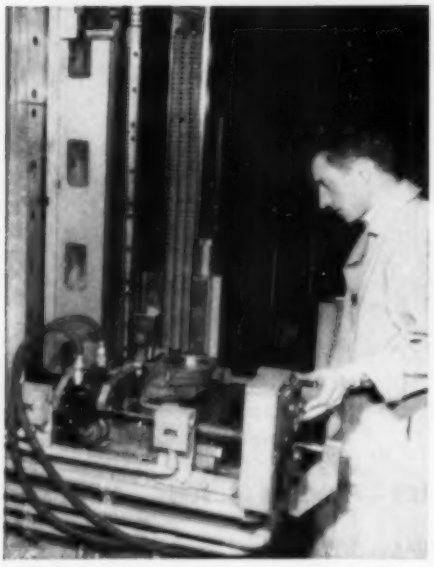
Cleveland Alloy Casting Co. and Castalloy Inc., 6111 Schaaf Road, Cleveland, have been formed by G. H. Phillips and R. A. J. Wellington. Mr. Wellington was formerly vice president of Precision Metalsmiths Inc. while Mr. Phillips is sales representative for Kolcast Industries Inc., both of Cleveland. Cleveland Alloy will produce heat, wear and corrosion-resistant steel castings in sand molds. Castalloy, the firm's sales organization, will supply shell

GE Boosts Gas Turbine Output To Meet Rising Demand

Next ten years will see a tremendous growth in the use of gas turbines as sources of inexpensive power in gas and petroleum applications, predicts E. C. Clark, Apparatus Sales Division engineer, General Electric Co. This view of the firm's assembly area shows turbines in various stages of construction



broached in a single pass ... the AMERICAN way



Combining *two* operations on an American SB 48-15 Single Ram Vertical Hydraulic Surface Broaching Machine enabled this automotive engine manufacturer to broach the radius and pad (which are non-adjacent) of the front engine cover *in one pass.*

The tooling for this operation consists of generating type broaches and shaving blades mounted on the main machine slide for broaching the radius and joint surfaces. In addition, a special hardened and ground guide is mounted on the table to guide generating type broaches and shaving blades which are pulled down by adapting the lower end of the holder to the machine slide. These broach the pad thus completing the two operations in one pass.

Automatic clamping, plus an automatic sliding table are two additional features of this American installation that help maintain a production rate of approximately 115 parts per hour at 85% efficiency.

Write for your copy of American's Circular 300.

YOU CAN SOLVE YOUR BROACHING PROBLEMS THE AMERICAN WAY

This is only one of thousands of problems solved during American's 25 years of experience in the manufacture of broaching machines, broaches, and broaching fixtures. A part-print or sample and hourly requirements are all it takes to start American engineers working on your problem. Write today!

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ANN ARBOR, MICHIGAN

See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

A 1-MACHINE FABRICATION SHOP!

"Buffalo" U.I.W.

Punch, slit, miter, shear flat bars
Cut, notch, cope, punch angles, tees, channels, I-Beams
Punch web and flange of channel
45° Miter
Trim leg of tee
Cope Angle leg
Cut rounds, reinforcing bars

CUTS — PUNCHES — SHEARS — SLITS — MITERS

YOUR STRUCTURALS WITHOUT CHANGING TOOLS!

For fabrication of a wide range of structural members, you'll find a "Buffalo" Universal Iron Worker a regular machine shop! Yet it takes only the space of one machine, and two operators can turn out work simultaneously — at a production clip, one at the punch head, the other at the shear or bar cutting head. Rugged electrically welded steel plate frame, not cast iron. Handy hold-downs. Easy, one-shot centralized lubrication system in most models. 5 models to handle your requirements. WRITE NOW for Engineering Bulletin, stating range of shapes and sizes to be fabricated.

"Buffalo"

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DRILLING PUNCHING SHEARING BENDING

mold castings, as well as investment castings from wax, polystyrene and mercury patterns.

GE Plans Record Expansion

General Electric Co., Schenectady, N. Y., will spend a record total of $175 million in 1954 for new and modernized plants and equipment, says Ralph J. Cordiner, president. This represents an increase of 24 per cent over the previous high of $141 million in 1953. The high level of investment in plants and equipment will continue in 1955, making it the second highest year in GE history.

May Close Freight Car Plant

Pressed Steel Car Co., New York, may well be out of the freight car business by the end of 1954, says John I. Snyder Jr., president and board chairman. The firm's Mt. Vernon, Ill., plant will be kept in stand-by condition for some time for possible military or other orders. Bulk of the firm's sales now are in products that range from oil well pumping equipment to milk cans.

Amana Firm Completes Project

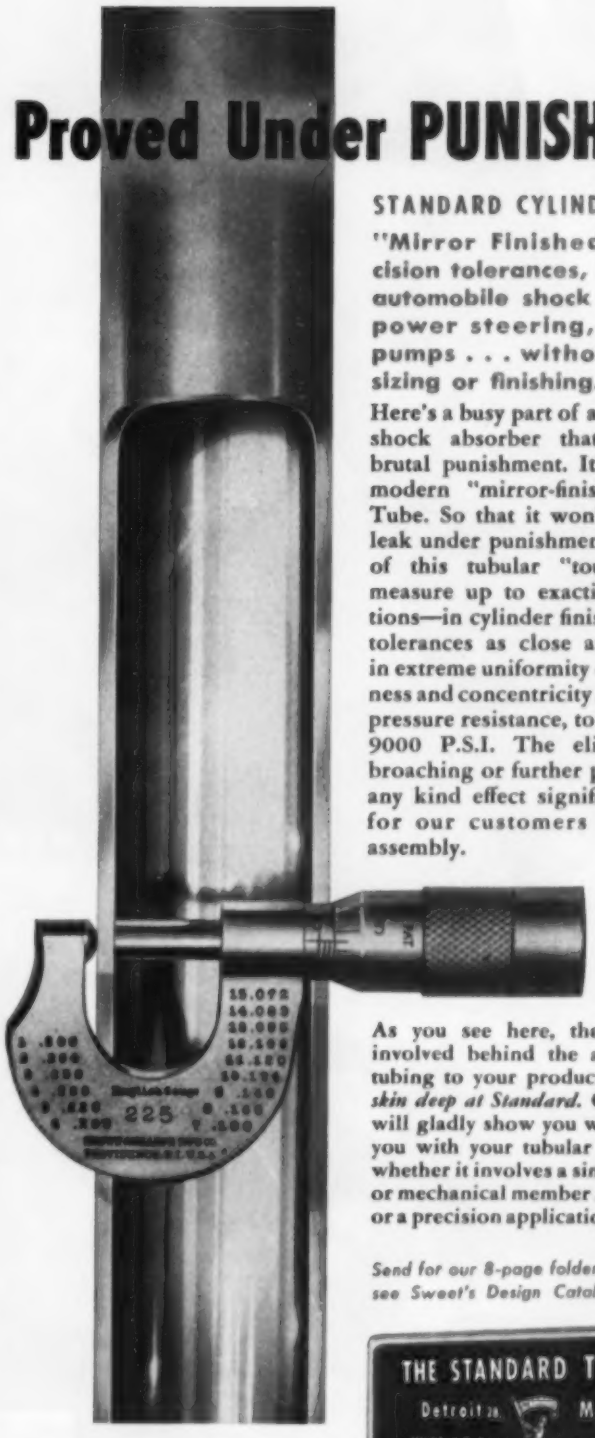
Amana Refrigeration Inc., Amana, Iowa, completed a $3.5-million expansion program that doubles the size of its plant and triples its productive capacity. New equipment includes eight high-speed (200 to 600-ton) presses. With other presses in Amana's sheet metal department, the plant makes all the stampings and fabricated parts required for manufacture of freezers and room air conditioners.

Leeds & Northrup To Build

Leeds & Northrup Co. will construct an instrument plant on a site adjacent to North Wales, Pa. Estimated cost of the 250,000-sq-ft building, including additional equipment, is in excess of $4 million. Occupancy is scheduled for the latter part of 1955. The plant will not replace the firm's long-established headquarters and other properties in the Germantown section of Philadelphia. Certain leased

(*Please turn to page* 84)

Proved Under PUNISHMENT



STANDARD CYLINDER TUBING

"Mirror Finished" to precision tolerances, it's used in automobile shock absorbers, power steering, hydraulic pumps . . . without further sizing or finishing.

Here's a busy part of an automobile shock absorber that's built for brutal punishment. It's Standard's modern "mirror-finish" Cylinder Tube. So that it won't weaken or leak under punishment, every inch of this tubular "toughie" must measure up to exacting specifications—in cylinder finish . . . in I.D. tolerances as close as .001" . . . in extreme uniformity of wall thickness and concentricity . . . in internal pressure resistance, to shocks up to 9000 P.S.I. The elimination of broaching or further processing of any kind effect significant savings for our customers in product assembly.

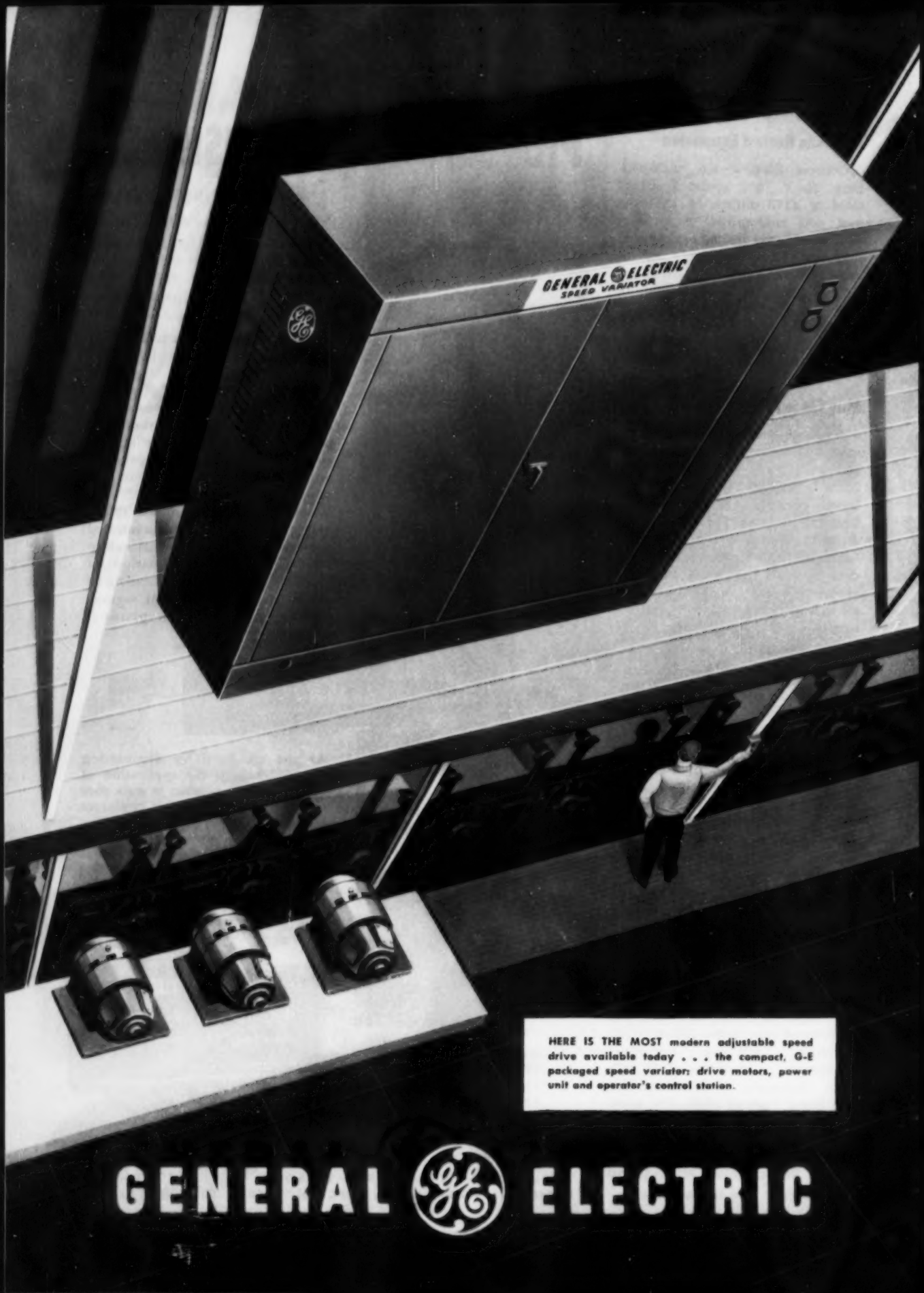
As you see here, the engineering involved behind the application of tubing to your product is *more than skin deep at Standard.* Our engineers will gladly show you why in helping you with your tubular application—whether it involves a simple structural or mechanical member . . . or a precision application.

Send for our 8-page folder or see Sweet's Design Catalog.

MAKE "STANDARD" YOUR SOURCE FOR—

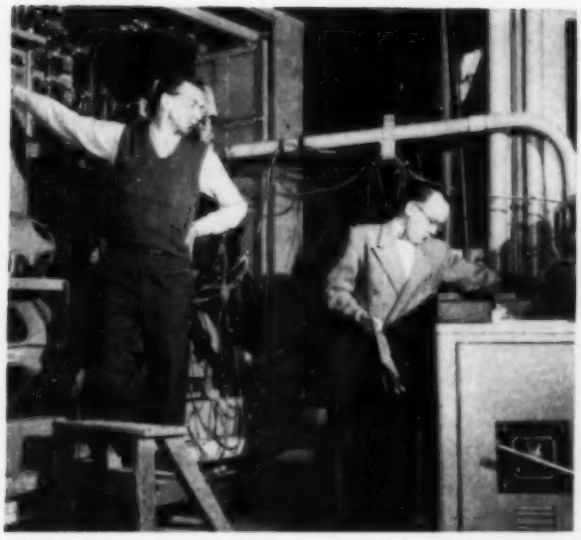
- WELDED MECHANICAL TUBING
- WELDED STAINLESS TUBING
- BOILER AND HEAT EXCHANGER TUBING
- EXCLUSIVE "RIGIDIZED" PATTERNS

STEEL TUBING SIZES: ½" O.D. TO 5½" O.D.—.028 TO .260 WALL.
STAINLESS SIZES: ¼" O.D. TO 4½" O.D.—.020 TO .154 WALL.



HERE IS THE MOST modern adjustable speed drive available today . . . the compact, G-E packaged speed variator: drive motors, power unit and operator's control station.

GENERAL ELECTRIC



COMPLETELY PRETESTED by G-E engineers in the factory, the packaged speed variator comes to you tailored to your job. Picture shows a power unit on one of the factory tests.

PACKAGED DESIGN of G-E speed variator simplifies installation, saves space and lessens your maintenance problems. Picture shows ready accessibility of all parts.

4 Good Reasons for Buying G-E PACKAGED Speed Variators

There's a ***difference*** among adjustable-speed drives; here's why the General Electric ***packaged*** speed variator is your best buy:

1—JOB-TAILORED. When your new G-E drive is delivered, it has already been tailored to your specifications. It's coordinated, packaged, assembled and ***completely tested*** before it leaves the G-E factory. It's been ***engineered*** as a package to help meet your needs.

2—MORE COMPACT. Because there are only three components to the G-E ***packaged*** speed variator (see opposite page), less space is needed for the complete installation. This cuts down on costly, interwiring problems, and leaves valuable floor space available. The G-E packaged speed variator is designed to be located near your equipment . . . up above, in a basement, right next to drive motor . . . anywhere you wish. No need for expensive control housing and associated ventilating system.

3—FASTER INSTALLATION. Your installation costs drop radically and your new G-E drive is in operation faster because it's packaged in the G-E factory before it's shipped to you. Long, unproductive work-stoppages are no longer necessary.

4—LESS MAINTENANCE. Your speed variator is made up of the standard, General Electric controls and rotating equipment that have proven their reliability and long life in many thousands of applications throughout industry. Because of these top-quality G-E components, maintenance is only a routine problem. And even ***routine*** maintenance is simplified because of the ready-access doors on the equipment. This packaged simplicity pays off in less downtime and actual dollar-savings in maintenance each year.

For further information, see your nearby G-E Apparatus Sales Office, or send in coupon. General Electric Company, Schenectady 5, N. Y.

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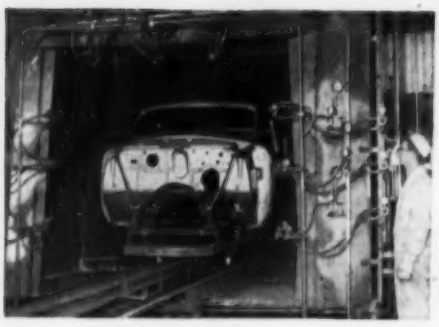
STUDEBAKER

PAINTS BODIES WITH RANSBURG *Electro-Spray*



Automatic electrostatic spray enables Studebaker to apply a heavier and more uniform primer surfacer while giving them a net saving of 1.81 per body in paint and direct labor. Not only is the Ransburg method providing the desirable increase in uniform film thickness, but it is enabling Studebaker to paint more bodies per hour with the substantial savings in paint and labor over the former hand spray method.

The heavier, and enduring, first coat on Studebakers provides the necessary base for the superior finish . . . a finish which resists all kinds of exposure conditions, such as combinations of warm and humid climate, and prolonged bright sun exposure.

Whatever your product may be—large or small—if your production volume justifies conveyorized painting, chances are that one of the RANSBURG electrostatic processes can do the job better, and for less. Write or call for data and detailed information on numerous and varied installations.

Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

RANSBURG

(*Continued from page* 81)

properties in the latter city will be relinquished. When the new plant is in operation and the leased properties abandoned, the total area in use will be increased from about 500,000 sq ft to 600,000 sq ft.

Arcair Co. Broadens Line

Arcair Co., Lancaster, O., acquired the manufacturing rights of Meldrum burner's aid, formerly manufactured by Meldrum Engineering Co., San Francisco. The tool is used to adapt gas torches for accurate cutting of circles, bevels and contours.

Firms Plan Consolidation

New York Shipbuilding Co., Camden, N. J., and Nesco Inc., Jacksonville, Ill., plan consolidation, subject to approval of stockholders. Nesco is a fabricator of kitchen and household equipment.

Farrington Enters New Field

Farrington Mfg. Co., Boston, metal specialties, entered the electronics field, having acquired Electralab Inc., Cambridge, Mass. Officers of the new division are D. H. Farrington, president; C. R. Shipley Jr., vice president and general manager; F. Hall Hatley, treasurer; and Albert R. Hughes, vice president, sales and engineering.

Timken Increasing Capacity

Timken Roller Bearing Co., Canton, is increasing its capacity to produce bearing races by 750,000. This is being accomplished by purchasing eight additional single spindle screw machines from National Acme Co., Cleveland, with delivery expected in about 10 months.

Pontiac Gets Army Contract

General Motors Corp.'s Pontiac Motor Division, Pontiac, Mich., is building under Army ordnance contract for the Air Force the fastest-firing automatic gun ever mass-produced. This "gun, automatic, 20mm, M39" was developed as the phenomenal increase in aircraft speeds demanded comparable in-

"Sure,
I'm Top Brass—
and mighty proud
of it, too!"

The Brass

The new doorknobs on the Pentagon are brass, and GIs who recall the frosty remarks of some high ranking officers about their use of the term will get many a chuckle out of the change.

The old hardware on the main entrances was cast iron but it was rusting away and the building managers were reported to have received complaints about broken fingernails from some of the personnel. Since a taut military organization can't handle paperwork properly or even stand a passable inspection, on or off duty, under such conditions, we think the change is all for the better.

But we never could see the objection to the word "brass" as applied to the higher military echelon by those of lower rank. The term not only has a ring of authority to it, there is even good authority for its use. It comes from "brass hat" and Webster tells us that this means "a general or staff officer; — from the ornamental gold braid on the cap. *Slang.*" So those who want to try to stop use of the term must first stop using brass all over themselves and leave it for the doorknobs.

Even so some other descriptive terms will come about. A little poke at pomp and circumstance is part of a citizen military establishment. Any soldier who laughs at himself as nothing but "government issue" along with the guns and rations is not going to stop there.

Further, if the present GIs indulge in the same unrestrained nomenclature we remember, ranking officers ought to be happy to settle quickly for just brass.

Editorial from the WALL STREET JOURNAL

BRASS *opens the door to the solution of countless problems in fabrication and use. And Bristol has an exceptional record of 104 years as a dependable supplier of top-quality strip, wire, and rod. In fact—*

"Bristol-Fashion" means **Brass at its Best**

THE BRISTOL BRASS CORP., BRISTOL, CONN. OFFICES OR WAREHOUSES IN PRINCIPAL CITIES

creases in the firepower of their armament. Ammunition is carried into the firing chamber in a revolving cylinder, similar to the old six-shooter. It is fired electrically and is gas operated.

Anderson Brass Works Expands

Anderson Brass Works, Birmingham, is constructing an aluminum foundry and processing plant at Leeds, Ala., at a cost of about $75,000.

Milwaukee Firm Changes Name

Milwaukee Flush Valve Co., Milwaukee, changed its name to Milwaukee Faucets Inc. The firm's principal products are plumbing fixtures for the home.

Raymond Corp. Expanding

Raymond Corp., Greene, N. Y., maker of electric fork lift trucks, hand pallet trucks and allied materials handling equipment, will add 55,000 sq ft of space to its plant facilities.

Reynolds Lifts Capacity

Billets are reduced in cross-section and lengthened by this 3-high breakdown mill which was completed recently at Sheffield, Ala. The facility is operated by Reynolds Alloys Co., a subsidiary of Reynolds Metals Co., Louisville, has an annual capacity to produce 36 million pounds of aluminum wire, rod and bar products

ASSOCIATIONS

American Supply & Machinery Manufacturers' Association Inc., Pittsburgh, elected T. D. Vander Voort, Clemson Bros. Inc., Middletown, N. Y., president; Clarence B. Noelting, Faultless Caster Corp., Evansville, Ind., 1st vice president; Charles T. Jordan, Charles Parker Co., Meridan, Conn., 2nd vice president; S. H. Cross, Stanley Electric Tools Division of Stanley Works, New Britain, Conn., secretary; and Dan C. Swander Jr., Columbian Vise & Mfg. Co., Cleveland, treasurer.

R. H. Barr, Reilly Bros. & Raub Inc., Lancaster, Pa., is president of **National Industrial Distributors Association**. Vice presidents are Stuart A. Russell, J. Russell & Co. Inc., Holyoke, Mass.; Frank M. Cruger, Indiana Manufacturers Supply Co., Indianapolis; and C. E. Gollwitzer, Pratt-Gilbert Hardware Co., Phoenix, Ariz.

Southern Industrial Distributors' Association elected C. McD. England Jr., Logan Hardware & Supply Co., Logan, W. Va., president; Paul J. Stine, Harry P. Leu Inc., Orlando, Fla., 1st vice president; and Ashley DeWitt, Briggs-Weaver Machinery Co., Dallas, 2nd vice president.

Thomas G. MacGowan, Firestone Tire & Rubber Co., Akron, was elected president of **American Marketing Association**, Chicago.

REPRESENTATIVES

Clark Equipment Co., Buchanan, Mich., granted franchises for the sale and service of its fork-lift trucks and other materials handling equipment to Erie Industrial Trucks Inc., Erie, Pa.; Thompson & Johnson Equipment Co. Inc., Syracuse, N. Y.; and Materials Handling Equipment Co., Edmonton, Alta.

Baldwin - Lima - Hamilton Corp., Eddystone Division, appointed Robert Abel & Co., Brookline, Mass., as its exclusive agent for sale of SR-4 crane scales.

Pennsylvania Optical Co., Reading, Pa., manufacturer of protective equipment, made the following sales appointments: Richard N. McCord will serve the Boston area from headquarters at 19 Neillian Way, Bedford, Mass.; Regis H. Voye will serve the Buffalo area from 285 Parker Ave., that city.

Gibney-Coffman Corp., Buffalo, changed its name to **Gibney-Decot Corp.** V. F. Decot was elected vice president of the new organization which is a representative in western and central New York for a number of foundry, forging and gear companies.

Russell M. Hagan was appointed head of **Airtemp Construction Corp.'s** new office in the Title Guaranty building, St. Louis. Airtemp Construction is a subsidiary of Chrysler Corp.'s Airtemp Division, Dayton, O.

Century Electric Co., St. Louis, manufacturer of electric motors, generators and selective speed drive units, opened a branch at 634 S. Cedar St., Charlotte, N. C. T. K. McKamy is district manager.

Beryllium Corp., Reading, Pa., appointed Williams & Co. Inc., Pittsburgh, as distributor of its beryllium-copper strip, rod and wire.

Aluminum Industries Inc., Cincinnati, appointed S. O. Bradley & Son, Asheville, N. C., as distributor of its aluminum paints and varnishes.

Leach Relay Co., Los Angeles, will act in 11 western states as the exclusive distributor of selenium rectifiers, made by **Fansteel Metallurgical Corp.**, North Chicago, Ill.

Herman Pneumatic Machine Co., Pittsburgh, appointed Hewitt-McGrail Co., Houston, as its representative in Texas, Louisiana and Arkansas.

Waltz Furnace Co., Cincinnati, maker of industrial furnaces, appointed Charles J. Paumier as its West Coast representative. His headquarters are at 908 S. Atlantic Blvd., Los Angeles.

McLouth
STAINLESS
Steel

High quality stainless sheet and strip steel . . . for the product you make today and the product you plan for tomorrow.

McLouth Steel Corporation
DETROIT, MICHIGAN
Manufacturers of Stainless and Carbon Steels

JONES & LAMSON REPLIES TO AN OFT-REPEATED QUESTION

"What is High Velocity Turning?" Hundreds have asked — and here is the answer

The word is spreading.

As J&L's Production Seminars go on, telling and showing how "High Velocity Turning" can increase metal turning production, reduce costs, and improve surface finish, increasing numbers ask this question.

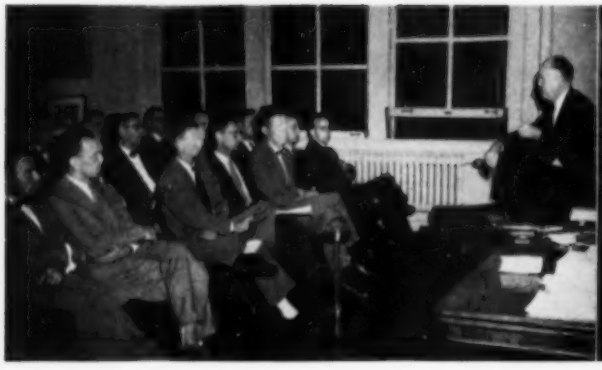
An optimum balance between tool life and tool cost gives the best production rate for each production dollar — generally at much higher surface speeds than usual. This permits and demands the use of harder grades of carbides and more efficient cooling. We call this "High Velocity Turning".

At our two-day Seminars, groups of Master Mechanics and production executives are told how J&L approached the subject scientifically — are shown how it is done out in the shop — and are given a demonstration of the engineering proof and the advantages to be gained.

For two years now, visitors have been convinced, and invariably put it to work back in their own plants.

Results are phenomenal.

Does *your* plant use "High Velocity Turning"?



PRODUCTION P.S. STUDIES → *Seminars are booked to capacity at present — but we are now reserving for next Fall.*

JONES & LAMSON MACHINE COMPANY

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THREAD & FORM GRINDERS • OPTICAL COMPARATORS • THREADING DIES

STEEL

May 31, 1954

Technical Outlook

DID YOU KNOW?— All metals do not fail at low temperature. Some gain reliability as the mercury falls. Face-centered, cubic-lattice structures, such as copper, aluminum, nickel, lead, their alloys and austenitic steels are in this class, Clarence H. Lorig, technical director, Battelle Memorial Institute, recently told the ASM at Cincinnati. Sensitivity of some austenitic steels to cold can be traced to small quantities of ferrite, sigma, carbide or other precipitates in the austenitic matrix.

TESTING— AEC scientists may have the answer to an inexpensive, portable x-ray unit. Thulium is mounted in a source holder and shield, which is equipped with a shutter mechanism to take x-ray photos. Shutter is operated by a standard photographic cable release. Unit, which does not need an electrical power supply, weighs less than 10 pounds and has the energy of a 100,000-volt x-ray machine.

NEW SPEC— A54S (or GR40A) has been approved for unfired pressure vessels by the Boiler Code Committee of ASME. The Alcoa alloy is said to offer higher mechanical properties than any previously approved for welded pressure vessels; so, allowable design stresses are higher. Welding can be done by any of the conventional methods but semi-automatic, inert-gas, metal-arc process and the inert-gas, metal-arc (tungsten arc) are preferred.

PLATING—When shortages let up, a new nickel plating is expected to do big things in aluminum appliances and furniture. Bond with certain aluminum alloys is said to be so strong that the composite can be deep drawn and later finished with chromium plate. Development is a co-operative effort of International Nickel Co. and aluminum alloy producers. The company also has a new procedure for producing a heat-treatable, nickel-phosphorous alloy for hard surface nickel electroplating. Hardness is practically doubled by heat treatment.

COATING WIRE—In place of melting a protective metal coating like copper around a steel billet (later drawn), a new process electroplates wire rod, which is fed as a spiralled coil. Machinery is compact; steel wire can be treated with copper, nickel or other metals in a space 6 x 30 feet. Process was developed by Kenmore Metals Corp., Jersey City, N. J.

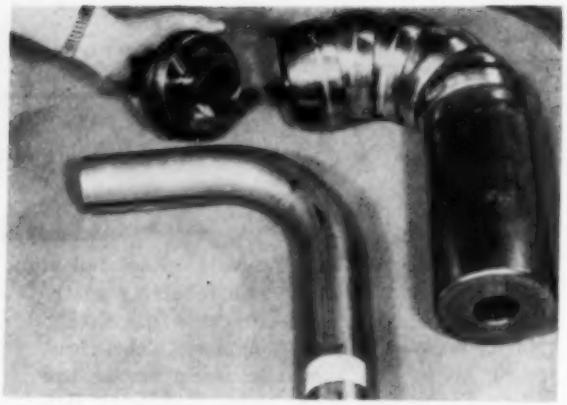
MUSICAL ALLOY—By combining electrolytic manganese with electrolytic copper, Bureau of Mines is able to make an alloy that absorbs noise and vibration. Change of composition or heat treatment also can make it ring like a bell. In either instance, tensiles are over 100,000 psi. Ductility is good. Other properties are under investigation.

FASTENERS—Research Council on Riveted and Bolted Structural Joints has changed specifications on washers, painting, assembly and inspection. For example, the revision permits the use of flat washers with all wide flange beams and requires use of beveled washers only with American Standard beams and channels; and any joint in which slip into fastener bearing is not objectionable now may be painted.

VACUUM ALL THE WAY— Complete setup for vacuum melting and centrifugally casting in vacuum is being built by F. J. Stokes Machine Co., for Utica Drop Forge & Tool Corp. Utica metallurgists say that vacuum processing adds greatly to service life of high-temperature alloys, such as Waspalloy and M-252. Induction melting equipment for the process is being built by Tocco.

Metalworking Outlook—p. 39 *Market Outlook—p. 135*

Note power-operated mandrel on this aircraft bender. Close fit is used to obtain sizing effect on tubing



Here's a wrinkle-free aircraft bend with 2½-inch stainless (0.020 wall). Centerline radius is 5 inches

Sharper *Bends* for Ultra-thin Tubing

Production machines make bends on centerline radii equal to two diameters on tubing ranging up to 5 inches in diameter with 0.025-inch walls. Outside wall is stretched

HERE'S one way fabricators of thin-wall, stainless-steel tubing are putting the knife to forming costs.

As you know, conventional methods of fabricating large diameter tubing with tight radii are difficult and expensive. Now you can get a production bending machine to do the work.

A large aircraft manufacturer reports the machines are saving them $14,000 a plane.

Development — Flexonics Inc., makers of stainless-steel tubing, handed the ultra-thin-wall problem to Pines Engineering Co. Inc., Aurora, Ill., late in 1951. In less than a year, Pines was using its equipment to bend stainless tubing (4 inches in diameter with a wall thickness of 0.025 inch) to a centerline radius of 6 inches. Bend, which was without wrinkles or distortions, was 1½ times tube diameter.

First aircraft jobs were done on standard Pines tube bending machines. Later, better results were obtained by taking slack out of manufacturing tolerances on tooling to confine metal as closely as possible.

Now you can get production bends on centerline radii equal to two diameters with: Tubes 1½ and 2 inches in diameter, with 0.016-inch walls; 4 inches in diameter, with 0.017-inch walls; 2½, 3, 4 and 4½ inches in diameter with 0.020-inch walls; and 5 inches in diameter, with 0.025-inch walls.

Case History — The aircraft people saving $14,000 a plane previously used drop hammers to produce thin-wall, large-diameter tube bends. Blanks were formed into two half sections, which were welded together. Drop hammer equipment and the thousands of blanking and forming dies represented a huge investment. Each size tubing, angle and radius called for an individual set of dies.

Sections were welded by hand and required 100 per cent inspection. Scrap losses were high.

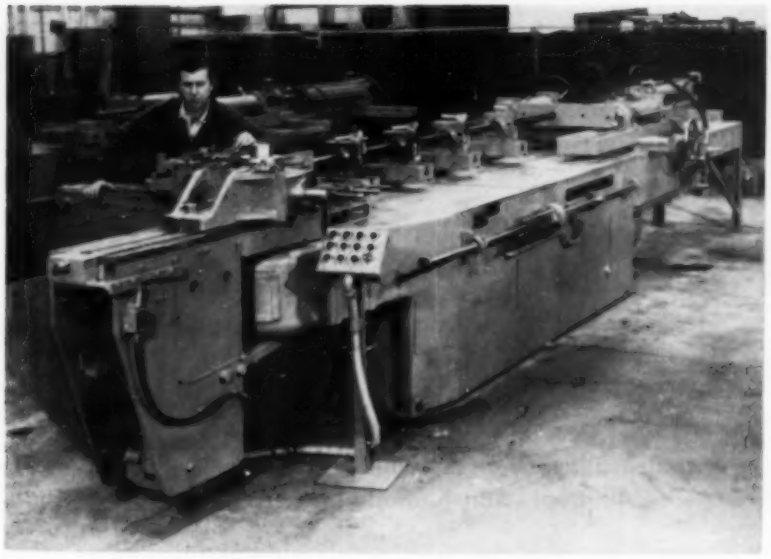
So the simplified process seemed to be just what the doctor ordered, but before this company and others could take full advantage of tube-bending machines, a hurdle had to be crossed.

Too Many Sizes—As space gets more cramped in aircraft, bend radii of parts are reduced. Radii differing by fractions of an inch are common. Obviously, the industry couldn't cash in on bending equipment until radii standards were established.

Now it is possible for the designer to specify minimum standard radius for 80 to 85 per cent of his bends; and at least five major aircraft companies are standardizing tube bends on a radius to center-line of two diameters.

It should be noted, however, that the selection of the minimum standard is a decision to be made carefully. By reducing radius, you increase the stretch of the outside wall.

Flexibility — Standardization



Machine is completing a bend on 4-inch diameter tube with 0.020 wall thickness to 8-inch centerline radius

means that comparatively few basic tools for each tube diameter and wall thickness are needed to accommodate majority requirements.

For example, a single set of bender tools for a given tube size and radius can be used on any angle up to 180 degrees. Machines have an instantaneous angle-of-bend setting. Last-minute design or production changes affecting angles take only simple adjustments—and no retooling time.

Lighter—Much weight is pared by eliminating heavy weld beads and excess stock in flanges. Tubing once bent from heavier wall thicknesses of 0.035 to 0.065 inch often can be replaced by a lighter wall material.

Tubes are cleaner; and the slow and expensive removal of weld flash from the inside of the tube is bypassed.

Improved Properties—Bending is a precision drawing operation. Inside wall is compressed; and the outside wall of the tube is stretched in the bend. It had been assumed wall reduction was not desirable, but research has disclosed definite advantages.

Stretching during the bend work hardens the tube. Tensile strength and hardness are increased to fully compensate for loss of wall thickness.

Reduction of the outside wall from 0.025 to 0.020 inch, for example, hikes yield strength from 66,600 to 110,000 psi. This increase prevails in all materials, including aluminum and other nonferrous metals.

Tailoring — Although standard machines did the work, Pines made four changes to simplify operations and improve performance.

Since mandrel tolerances no longer allow hand loading of the tube, a means is provided to force the close-fitting mandrel into the tube. Machine circuits have been rearranged to give the operator push-button control of all forward and reverse machine movements.

Precision, hand-scraped ways, slides and die-mounting surfaces provide precise alignment and better tooling fit. A die holder of the roller bearing, precision type assures free movement with the tube under extreme follower pressure.

Tube Specs—Bending tool tolerances for tube fit once allowed for variations permitted in the manufacture of tubing; but to make wrinkle-free bends in ultra-thin sections, such variations are not permissible. Cold sizing procedures have been developed to correct this situation. Boeing was the first to do this successfully.

It also was necessary to design tools with tolerances proportionate to wall thickness; and precision machining and heat treatment of the tooling are required to reduce tool setup time and assure greater interchangeability of tools.

Here is the tube that came off the machine in the above photograph. The flexible mandrel has five ball segments

How to Heat Treat Titanium

Potential here looks good. Several methods of heat treatment promise to increase alloy strength, while adequate ductility is maintained. Allotropic transformation is key

By C. I. BRADFORD
Vice President and Director of Operations
Rem-Cru Titanium Inc.
Midland, Pa.

SEVERAL of the commercial, high-strength titanium alloys are quite responsive to heat treatment, but only a few users have taken advantage of heat treatment to gain strength. Major reasons are that the relatively unexplored quench hardening is still rather complex, and more conventional treatments have given brittle products.

But the picture is changing. A number of promising heat treatments capable of enhancing alloy strength, while maintaining adequate ductility, are being investigated.

Heat-treat potential of most titanium-base alloys is based on the fact that the metal has an allotropic transformation. It can exist as two different crystal structures—one transforming into the other, depending upon temperature. The broad outline of the mechanism of alloy transformation hardening includes: 1. Formation of the higher temperature phase, beta, by heating, followed by sufficiently rapid cooling to retain some beta beyond the equilibrium point; and 2. Its subsequent transformation to the lower temperature phase, alpha.

Basic—Titanium, like other metals, is heat treated for three reasons: 1. Relief of stresses set up during cold forming or machining. 2. Full annealing after hot working, severe cold work or to provide maximum ductility for subsequent cold deformation and 3. Thermal hardening to improve strength — usually at some sacrifice in ductility.

Heat Treating—A-55 and A-70 cannot be heat treated, but the alloys, C-110M and C-130AM, can be strengthened by thermal treatment, with some decrease in ductility.

One method that shows promise: A water quench from about 1450° F, followed by aging at 900° F.

Surface Hardening—The chemical activity of titanium and its rapid absorption of oxygen, nitrogen and carbon at relatively low temperatures indicate the likelihood of improved performance for special applications through surface hardening. Some of the better approaches are:

1. Nitriding in pure nitrogen is effective. Atmosphere seems to be more efficient than dissociated ammonia. Case depth of 0.0035-inch has been obtained after 16 hours at 1600° F.

2. Carburizing produces a wear resistant case of 0.0001 to 0.0002-inch. Mixture of ½ per cent propane in argon at 1750 to 1800° F for 6 to 8 hours has been used.

3. Carbonitriding produces some surface hardening after 30 minutes at 1300° F. Mixture of propane, ammonia and cracked propane is used in a ratio of 2 per cent, 33 per cent and 65 per cent, respectively.

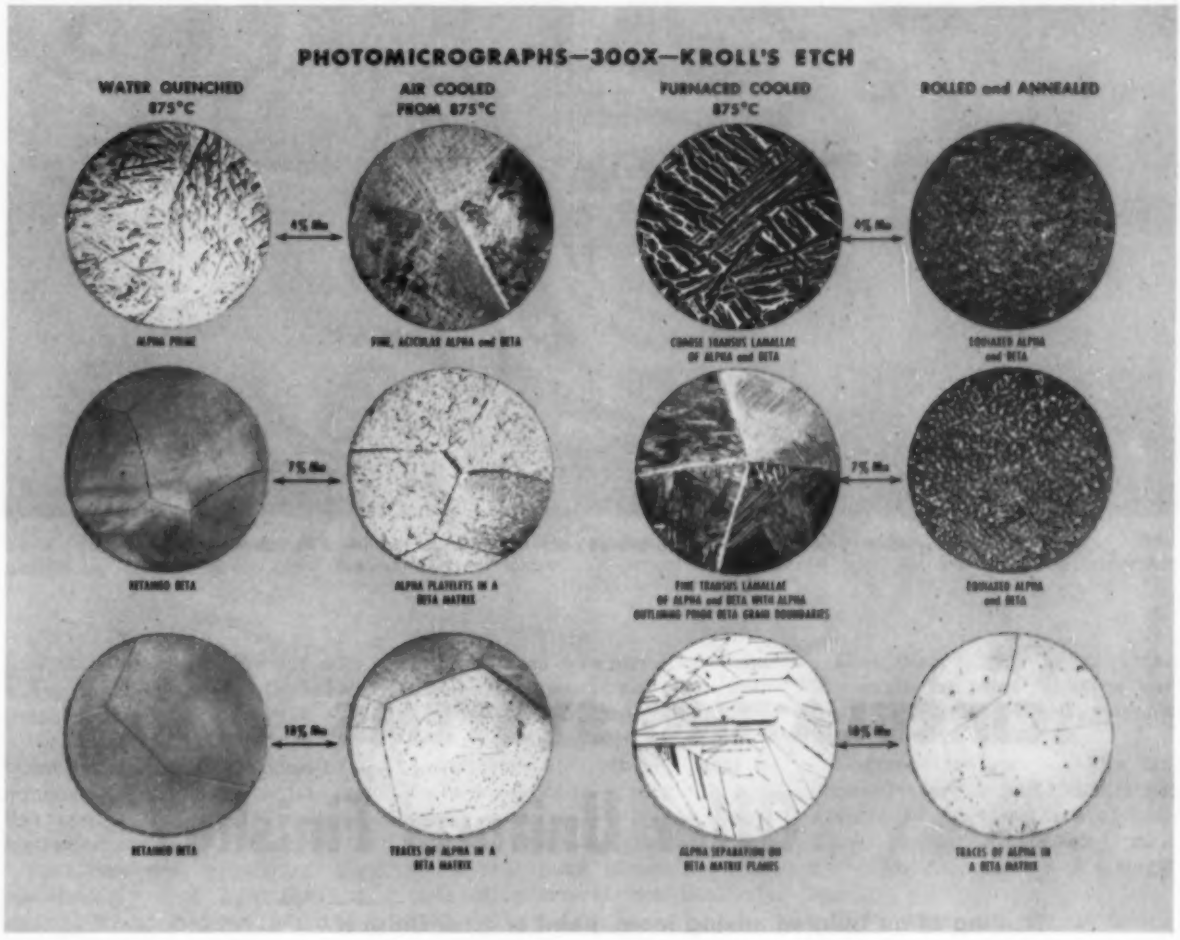
Alloys that respond to thermal hardening can be surface hardened by induction heating. But optimum temperatures for the solution and aging cycles have not been determined.

Considerations — It is expected that surface hardening of titanium and its alloys will become standard. Treatments should tend to overcome susceptibility to galling and seizing, and there is reason to hope that corrosion resistance will not be harmed, perhaps even improved.

Beta and alpha-beta alloys have advantages here. Beta phase absorbs nitrogen and carbon more readily than the alpha. Commercially-pure grades and all-alpha alloys cannot be induction hardened.

Stress Relieving—The stress relief anneal is a function of time, temperature and degree of prior cold work.

To achieve adequate partial relief of stress in a reasonable time,


PHOTOMICROGRAPHS—300X—KROLL'S ETCH
WATER QUENCHED 875°C
AIR COOLED FROM 875°C
FURNACED COOLED 875°C
ROLLED and ANNEALED
4% Mo
4% Mo
ALPHA PRIME
FINE, ACICULAR ALPHA and BETA
COARSE TRANSUS LAMELLAE OF ALPHA and BETA
EQUIAXED ALPHA and BETA
7% Mo
7% Mo
RETAINED BETA
ALPHA PLATELETS IN A BETA MATRIX
FINE TRANSUS LAMELLAE OF ALPHA and BETA WITH ALPHA OUTLINING PRIOR BETA GRAIN BOUNDARIES
EQUIAXED ALPHA and BETA
10% Mo
10% Mo
RETAINED BETA
TRACES OF ALPHA IN A BETA MATRIX
ALPHA SEPARATION ON BETA MATRIX PLANES
TRACES OF ALPHA IN A BETA MATRIX

Plates were etched in Kroll's etch. In the transformation structures presented, the alpha phase etches dark. Untransformed beta remains uncolored. In differentiating phases, caution is recommended. The alpha phase may remain absolutely white if it is sufficiently high in oxygen and nitrogen. Alpha seldom etches uniformly. The color, for a given etching time, will depend upon orientation of alpha grain or spacing of alpha needles

a temperature of at least 1000° F for about 30 minutes is recommended. For thin parts, a few minutes at temperature is usually sufficient. In the case of A-55 and A-70, when they are moderately stressed, temperatures as low as 650° F have been used.

C-110M normally is stress relieved at about 1050° F, C-130AM about 100° F higher.

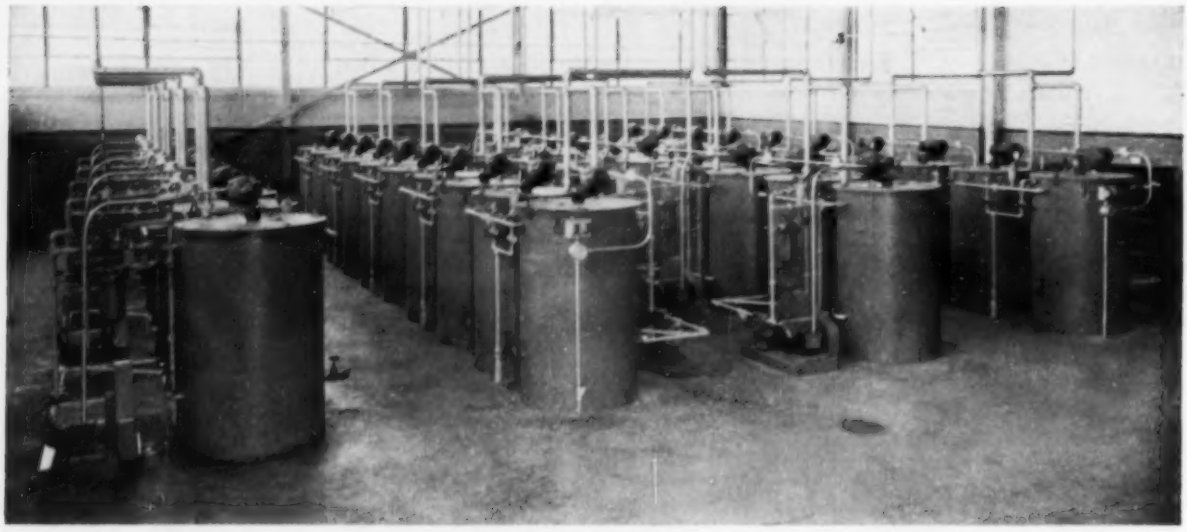
Annealing—For maximum ductility, a full annealing treatment at 1300° F is recommended. Time at temperature depends upon thickness—a few minutes for thin sheet and an hour for heavy sections. A-55, A-70 and C-130AM can be air cooled. C-110M should be cooled at a maximum rate of 5° F a minute to 1050° F, then air cooled.

Furnace atmosphere should be oxidizing, to minimize hydrogen contamination. A slight scale may be formed, but it can be removed by grit blasting or pickling in a water solution of 10 per cent nitric -2 per cent hydrofluoric acid at about 130° F.

Metallography — Techniques are similar to those used with other metals, even though several factors complicate microscopic examination: Materials typically range from 70 to 500VHN; their interstitial and intermetallic compounds are harder many fold; and the metal is allotropic, so that alpha titanium, beta titanium and a full spectrum of transformation structures are involved.

Rem-Cru has developed a procedure that is relatively simple, inexpensive and safe. Steps include rough, intermediate and final polishing—latter is either mechanical or electrolytic, using a nonexplosive solution.

This is the fourth in a series of five articles on titanium by Mr. Bradford. Next week he will discuss forming. Preceding articles included: May 10, Properties and Availability; May 17, Grinding; May 24, Hot Working.



Paint mixing room. Centralized supply provides each operator on the line with the same finish

CIRCULATING SYSTEMS . . . Offer Uniform Finishes

Starting at an isolated mixing room, paint or other finish is circulated to all spray stations, then back to the tanks. Both color and viscosity are precisely controlled

ONE of the surest ways to get uniform finishes on your products is to put color mixing and matching into the hands of one specialized group.

You can do this with paint circulating systems, but, of course, the prime consideration is: "Does my operation justify such an installation?"

In most instances, the answer is probably yes. Binks Mfg. Co., a supplier of paint circulating systems, estimates you can afford to put one in if you have two or more spray stations using identical colors in excess of 50 gallons a day.

Here's One—Binks' system uses an isolated mixing room. From this point, paint moves through a complete circuit—to all spray stations and back to the tanks. Constant circulation and agitation prevent settlement of pigment. Agitators in mixing-room tanks are driven by electric or air motors.

For abrasive materials, such as primers, an electric, motor-driven piston pump, with porcelain liners, or air pump is used. For other materials, such as lacquers and synthetics, an electric, motor-driven rotary or air pump is available.

Air-operated, piston-type pump is an innovation. For many years they were designed only as high-pressure, low-volume movers of heavy liquids, such as sound deadeners and greases. Now, low-pressure, high-volume pumps can be used to advantage in some paint circulating systems.

One more point: Motors, wiring and switches in the paint room should be explosion-proofed.

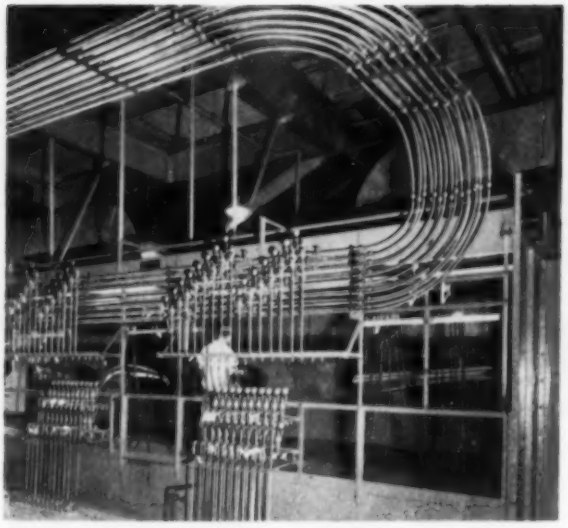
Details—All paint, regardless of color or type, is mixed and circulated under laboratory control, making it possible to keep a close check on color and viscosity.

Each color or type of finish has its own tanks and pipe lines. Tanks are usually connected in tandem. When the contents of one runs below a determined level, another is cut in.

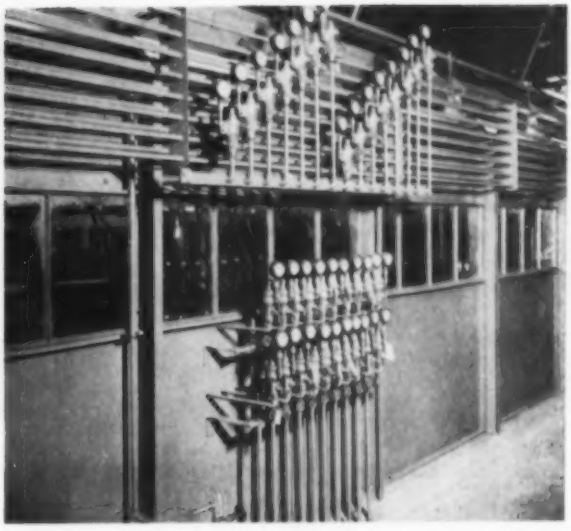
Hydrostatic gages show the number of gallons in the tanks at any time. They also make possible the control and viscosity through "weight" mixing of paint and thinner.

Supervision—With identical finishes being delivered to every gun at the same pressure, variables are reduced to a minimum. One supervisor can do the work that formerly required several.

Sensitive, fluid-pressure regula-



Color change-over is fast. It's simply a matter of picking up another gun. Note the economy of space



Pressures are set with a key by the foreman. They cannot be tampered with by the individual operator

tors at each station are set with a key by the foreman. Operators cannot alter pressure.

Uniformity—Rejects and subsequent refinishing are reduced to a minimum. Every operator on the line sprays the same finish, no matter where he is located.

Operators are relieved of the responsibility and headaches of color matching. Because fluid pressure and other variables at each station are determined for him, the operator has no responsibility for adjustments. He can devote his full attention to application.

They Like It—Because there is no need for material tanks, agitators, excess hose and other paint handling equipment, the plant looks neater. Operators respond to the improved atmosphere.

Accidents are reduced. There is no excess hose to untangle or trip over.

Check These—Management has found that paint circulating systems offer several incidental advantages, including:

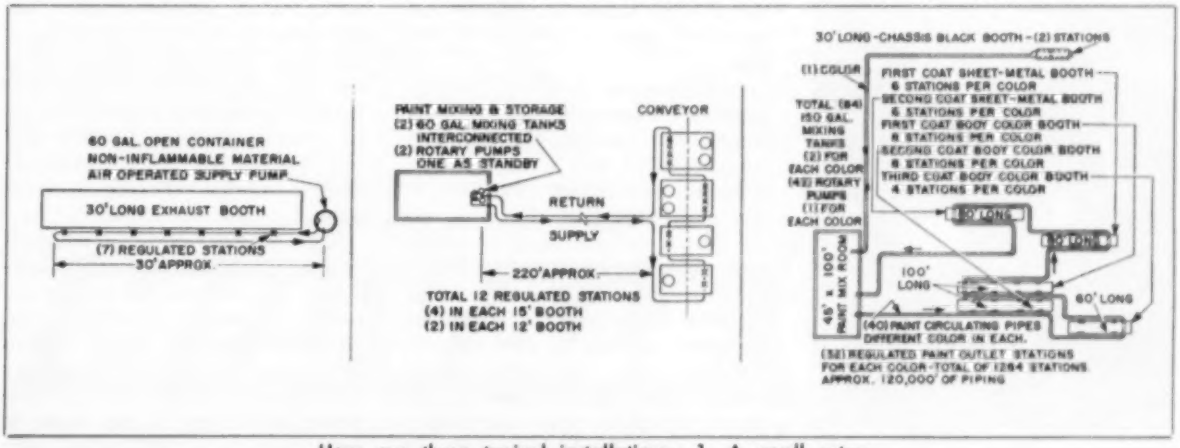
Systems eliminate the cost of moving paint and material tanks to and from booths.

There are no paint containers to clean, resulting in less wasted paints and a saving in labor and thinner.

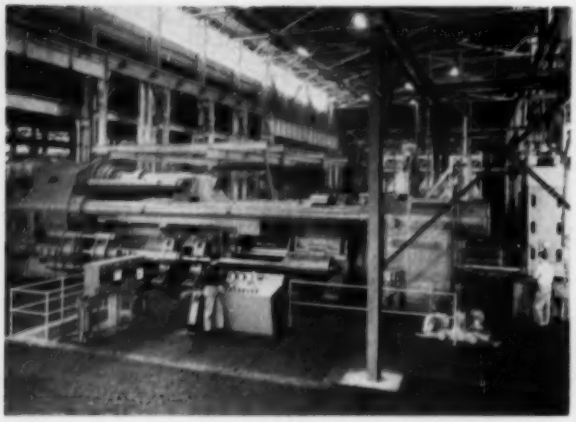
Less floor space is required. There are no paint tanks or material hoses to occupy valuable space or block passages.

Cheaper Insurance — Fire underwriters prefer paint circulating systems to other methods of handling paints. Flammable paint stores are concentrated in a single spot.

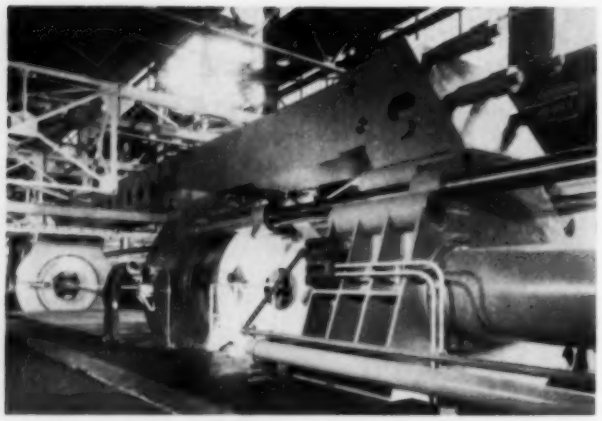
Here they can be protected under the most ideal conditions—mixing tanks can be supplied with a special, fused-link attachment to automatically close tank covers in the event of fire or high temperature rise. Mixing rooms proper are of fireproof construction.


60 GAL. OPEN CONTAINER
NON-INFLAMMABLE MATERIAL
AIR OPERATED SUPPLY PUMP
30' LONG EXHAUST BOOTH
(7) REGULATED STATIONS
30' APPROX.
PAINT MIXING & STORAGE
(2) 60 GAL. MIXING TANKS
INTERCONNECTED
(2) ROTARY PUMPS
ONE AS STANDBY
CONVEYOR
RETURN
SUPPLY
220' APPROX.
TOTAL 12 REGULATED STATIONS
(4) IN EACH 15' BOOTH
(2) IN EACH 12' BOOTH
30' LONG - CHASSIS BLACK BOOTH - (2) STATIONS
(1) C/SUDR
TOTAL (84) 150 GAL. MIXING TANKS (2) FOR EACH COLOR (42) ROTARY PUMPS (1) FOR EACH COLOR
FIRST COAT SHEET-METAL BOOTH
6 STATIONS PER COLOR
SECOND COAT SHEET-METAL BOOTH
6 STATIONS PER COLOR
FIRST COAT BODY COLOR BOOTH
6 STATIONS PER COLOR
SECOND COAT BODY COLOR BOOTH
6 STATIONS PER COLOR
THIRD COAT BODY COLOR BOOTH
4 STATIONS PER COLOR
30' LONG
30' LONG
45' x 100' PAINT MIX ROOM
100' LONG
60' LONG
(40) PAINT CIRCULATING PIPES
DIFFERENT COLOR IN EACH.
(52) REGULATED PAINT OUTLET STATIONS
FOR EACH COLOR - TOTAL OF 1264 STATIONS
APPROX. 120,000' OF PIPING

Here are three typical installations: 1. A small setup. 2. A medium-sized unit and 3. One of the larger units



Over-all view of the 14,000-ton Schloemann extrusion press now in operation at Alcoa's Lafayette, Ind., plant



Above is Alcoa's 3-million-pound stretcher, 180 feet long, used to straighten extrusions up to 110 feet long

Heavy Press Program in Action

Extruded aluminum shapes from the Schloemann press are the first of the light, strong aircraft parts to come from the big presses leased to industry

OPERATION of the 14,000-ton Schloemann extrusion press at Aluminum Co. of America's Lafayette, Ind., works gets production under way in one phase of the Air Force heavy press program.

The company reports the press at Lafayette will form four times the weight of aluminum previously possible in one squeeze. Producing the same extrusion, it will extrude two to four times as many pounds per hour as the largest previously existing press.

These extrusion cylinders, used in the Alcoa press, weigh as much as 57 tons

Alcoa's press was built originally by Schloemann, A. G., Dusseldorf, Germany. Almost complete at the end of World War II, the U. S. government had it shipped to this country where its capacity was enlarged from 13,200 to 14,000 tons.

Auxiliaries — Auxiliary equipment is impressive in its own right. For example, the 180-foot-long stretcher will straighten extrusions as long as 110 feet. It can straighten 75S aluminum alloy shapes up to 60 sq in. in cross-sectional area.

Press and stretcher operating together make possible extrusions weighing as much as 2500 pounds, 110 feet long. Size that can be produced in that length is increased to 22.7 pounds per foot.

Operation—Production cycle on the Schloemann press begins with ingot heating in a battery of 60-cycle induction heaters located adjacent to the press. Ingots, which vary from 15 to 29 inches in diameter and up to about 70 inches long, are heated at a rate sufficient to keep pace with maximum press production.

From induction heaters, ingots are fed automatically into the press, extruded through dies onto a long runout table attached to the extrusion die holder. When ingot has been extruded, runout table and die are moved forward hydraulically so butt end of the ingot can be sheared. Solution and precipitation treating normally are used to improve strength of extrusions.

Big Stretch—Next production step is performed on the 3-million-pound stretcher, where shapes are pulled to remove distortion and eliminate internal stress. Then extrusions are cut to length by a 96-inch saw. A 120-foot gas-fired, batch-type aging oven is used for final preparation heat treatment.

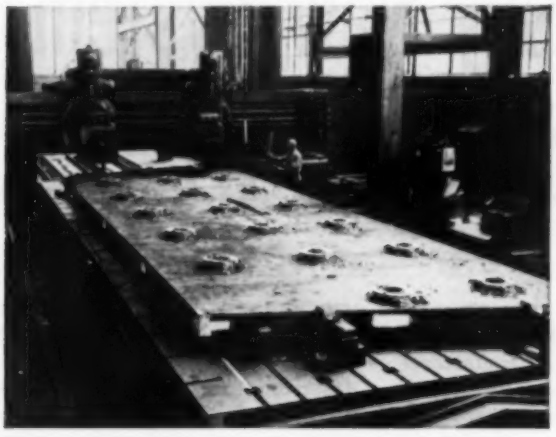
ON THE BEAM FOR AIRPOWER

POURING 405,000 POUND INGOT

. . . required heats from two open-hearth furnaces, each of 100 ton capacity. This was the first step by Midvale in making support beams for new Loewy-Hydropress designed and built 50,000 ton press for the Air Force heavy press program.

FORGING ON 14,000 TON PRESS

. . . to reduce 68 inch by 154 inch ingot to rough size and shape. Heat treated in temperature controlled furnaces to required physical properties . . . to withstand the stresses of tremendous pressures.



MACHINING 12′ x 40′ SUPPORT BEAM

. . . finish machining the faces of spacers on a large planer to assure close dimensions and fit with eleven other support beams which make up the head of this 50,000 ton press. Midvale machine tools are capable of handling rough and finish machining operations on all size products . . . large and small.

READY FOR ASSEMBLING

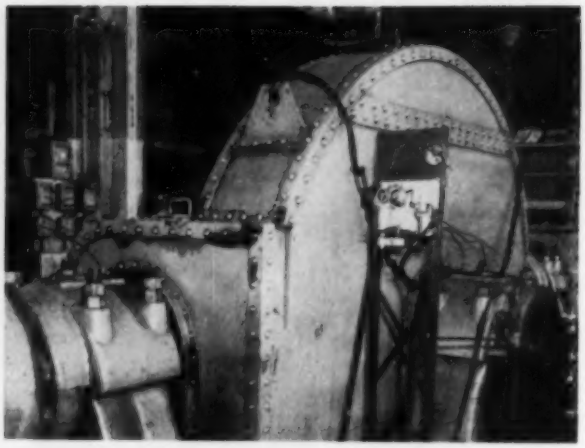
. . . beam is loaded on flat car for shipment. This is only one of 42 parts of similar design produced by Midvale for this press. Midvale was chosen by Loewy-Hydropress, Inc. for its complete facilities for forging, annealing, welding, stress relieving and finish machining. Why not use these facilities for your products?

THE MIDVALE COMPANY- Nicetown, Philadelphia 40, Pa.

Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

MIDVALE

FORGINGS, ROLLS, RINGS, FLANGES, STAINLESS STEEL CASTINGS



View at left shows four of the units mounted on pedestals. These four serve five different bearing points. Closeup, right, shows unit and mist lines

Lubricant Savings Buy New System

Sealing drive and driven bearings on delivery train at Alan Wood mill would have been too costly. Thirteen mist lubricating units do job with $400 per week savings

THIRTEEN automatic mist lubricating units serving the drive and driven bearings of the roughing train delivery of the thirty-inch hot strip mill of Alan Wood Steel Co., Ivy Rock, Pa., are producing an oil savings of approximately $400 per week as well as eliminating a previous fire hazard. This releases a full-time oiler and mop-up man for other duties and brings an "unbelievable" housekeeping improvement, in the words of R. G. Leister, lubrication engineer at the plant.

Application of mist lubrication to the 14 by 24-inch bearings, to replace the circulating oil system with which the United equipment was formerly lubricated, was undertaken approximately eighteen months ago by Leister on an experimental basis.

Oil Losses—"We were losing approximately 700 gallons of oil a week," Leister said. "At 74 cents per gallon for the 1800-sec. oil which the equipment manufacturer had specified for the circulating oil system, that was too much for lubrication. We tried Oil-Mist on one pedestal stand first, making the installation on a week-end shutdown. We tried an 1100-sec. EP oil, checked closely and charted temperatures, making adjustments in the unit until we had attained maximum results.

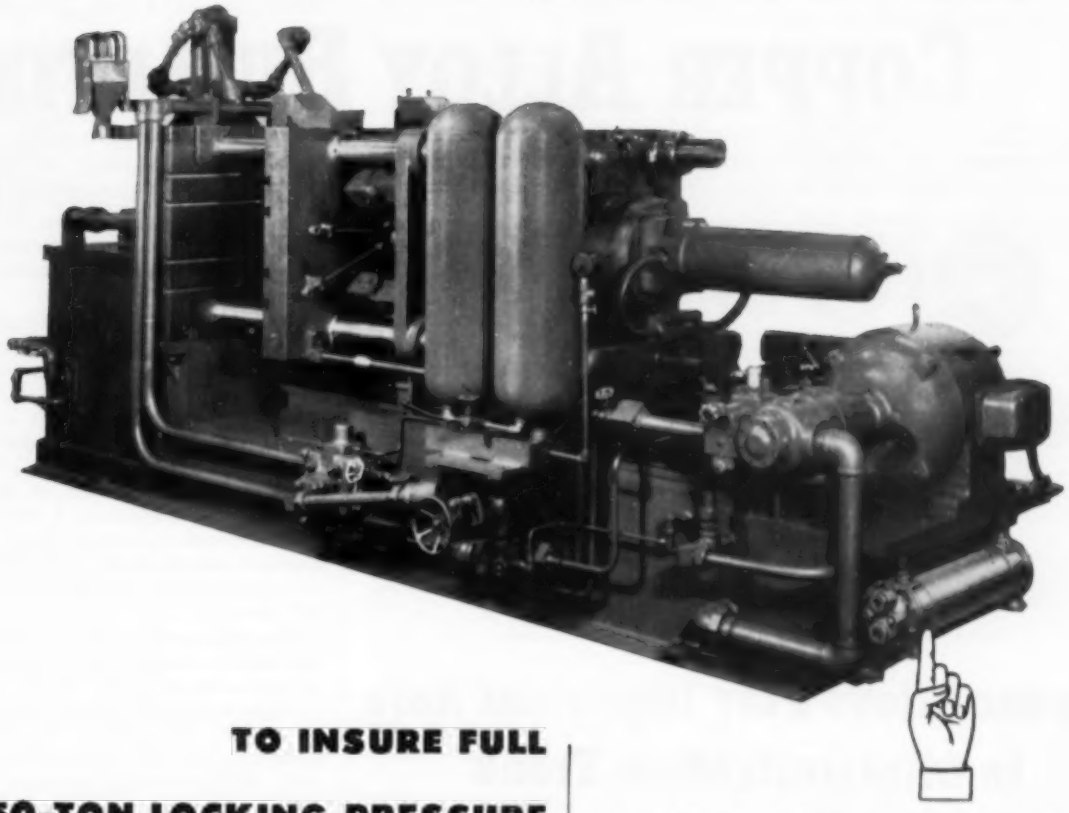
"Bearings have a clearance of ten to twelve thousandths, speed is 75 rpm, and bearing temperature is now 110° F. The top half of bearings, but not the pressure area, are radial ground. We use, on each unit, a heater for the oil reservoir which keeps oil temperature at 100 to 120° F while ambient temperatures frequently get below freezing."

Savings Pay—The thirteen Oil-Mist units use four ounces of oil per hour each, Leister said, or 480 ounces in a normal work week. Reservoirs are filled from the circulating oil system supply line, which is connected with a wing valve to each unit. Mist units are mounted on stands fabricated in the plant's own shop, employing lengths of angle iron, thus protecting the units from vibration of the machinery they serve.

All installations subsequent to the trial application were made on week-ends, with no down-time for applications. Alternative to use of this system, Leister said, would have been sealing of bearings, but this required general modification of each bearing and "excessive outlay."

The cost of application of Oil-Mist lubrication was recovered through savings in but a few weeks of use, he said.

KEEPS HYDRAULIC OIL properly cooled



TO INSURE FULL 450-TON LOCKING PRESSURE OF THIS B-T DIE CASTING MACHINE

ROSS EXCHANGER

Cycling 700 shots per hour, this B-T Die Casting Machine has been designed to exert a 450-ton locking pressure. To maintain rated capacity . . . *to prevent pump slippage from overheated, thinned oil,* a Ross Type BCF Exchanger has been installed. Oil temperature is kept within recommended limits.

Ross Exchangers are standard equipment on all B-T Die Casting Machines. "We have found them to be the most efficient type of cooler we have been able to obtain," states B & T Engineering and Sales Co.

Pre-engineered and fully standardized, Ross Type BCF Exchangers are regularly preferred for numerous other types and makes of hydraulic machinery. Unsurpassed in thermal efficiency and ruggedness, these compact, all-copper and copper alloy units are available with "off-the-shelf" promptness to meet most requirements.

Detailed information is in Bulletin 1.1K5. Write for your copy.

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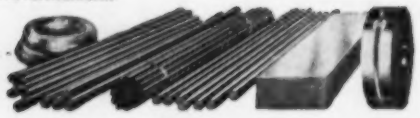
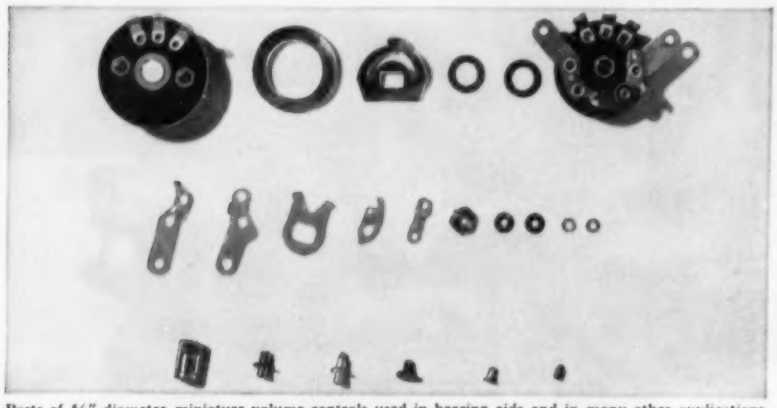


BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

Bridgeport Brass Co. MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



Parts of ½" diameter miniature volume controls used in hearing aids and in many other applications. Courtesy of Centralab, a Division of Globe-Union Inc., Milwaukee, Wisconsin.

Copper Alloys Play Important Role In Miniaturization Trend

Throughout the electronics industry, the trend is to smaller, lighter, more compact assemblies. Hearing aids, for example, must incorporate all the elements of a radio amplifier in a package not much larger than the average cigarette case. Portable communications equipment like radio sets for aircraft and automobiles, miniature personal radios, walkie-talkie units, airborne radar receivers all must be designed so that every possible extra inch of space and ounce of weight can be trimmed off the finished product.

Miniature Volume Control

Illustrated above with its copper-base alloy components is a volume control no bigger in diameter than a dime. This type of control has a rating of 1/10 watt and is obtainable with resistance ranges of from 0 to 500 ohms and on up through 10 megohms. It is probably one of the smallest volume controls commercially available. It is currently being used as a component in many hearing aids, test instruments, miniature radios, microwave sets and other miniaturized apparatus.

Copper-Base Alloys Excellent for Precision Parts

Copper-base alloys are preferred for many electrical and electronic applications because of their fine properties. Conductivity, good corrosion resistance, ability to withstand severe forming operations, high wear resistance, excellent plating and finishing properties explain their wide use in the many thousands of products with which we are familiar.

Many of the parts in this control are made of brass. Some are plated with either nickel or cadmium for increased wear resistance or silver for improved contact characteristics.

Among the parts made from brass rod are the contact blade pivot pin, the mounting studs, the shaft, rivet, hex screw and nuts. The terminals were made from yellow brass strip which is easily stamped and formed. The spacers and washers were also made from brass.

Phosphor Bronze Vital in Electronics Equipment

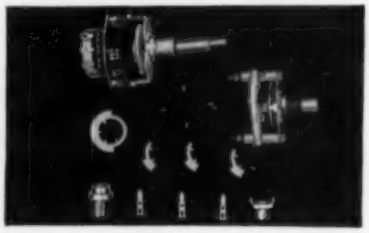
In complex assemblies like these volume controls and switches, satisfactory performance depends on each tiny part, especially those spring parts used in making mechanical and electrical contacts. For this reason, the selection of the correct alloy, temper, and gauge is most important.

The contact spring washer and spring pivot pin washer in the tiny volume control illustrated were made of Phosphor Bronze Grade C, approximately 92% copper, 8% tin, and 0.1% phosphorus. Supplied for these applications 8 B&S numbers hard, the material has a tensile strength of about 112,000 psi. It is widely used throughout the electronics industry because it combines superior spring properties as well as conductivity and high corrosion resistance.

Parts like contact springs must have high fatigue resistance to withstand millions of flexing cycles. Spring washers must withstand constant compression without taking a set if they are to be satisfactory. They must also be corrosion resistant under all climatic conditions. Phosphor Bronze meets all these qualifications and yet can be stamped and formed into precision parts. That is why Phosphor Bronze is in such wide use in the fields of radar, radio, television, sound reproduction and amplification, and in all types of electronic and electrical equipment and controls.

Bridgeport Brass Service

Bridgeport Brass supplies copper-base alloys—in strip, rod, tubing, and wire—used in the electronics field. Our Laboratory will be glad to assist you in the selection of proper alloys for your applications. Write for Bridgeport Brass Technical Handbook for properties and applications of copper-base alloys. Call or write the Bridgeport District Office nearest you. (714)



Parts of electronic switch and assembled switches. Courtesy of Centralab, Milwaukee, Wisconsin.

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

COPPER AND COPPER ALLOYS vs. SODIUM CHLORIDE SOLUTIONS (Cont.)

Satisfactory Galvanic Couples

The extremes in potential difference between various copper base alloys in sodium chloride solutions is small, seldom exceeding 0.2 volts. Consequently, copper and various copper alloys can be successfully coupled together when exposed to sodium chloride solutions.

The seriousness of galvanic coupling with dissimilar metals depends to a great extent upon the relative areas of the two metals in contact with one another. For example, if the exposed area of the copper or copper alloy coupled to steel is small, such as copper alloy bolts or brazed joints in steel plates, relatively little galvanic corrosion may occur. In such a galvanic couple the initial potential difference between the copper or copper alloy and low carbon steel may range from .3 to .6 volts. While this is a substantial driving force, its effect is nullified through stifling of the cathodic reaction on the relatively small surface of the copper alloy bolt head, nut or narrow brazing line. The stifling is due primarily to the deposition of magnesium and calcium carbonate or other material contained in the sodium chloride solution on the cathodic copper alloy surface. This explains why brass and bronze bolts stand up satisfactorily when used to fasten steel or cast iron parts in sodium chloride solutions.

Where a relatively large area of copper is coupled to steel, then it is advisable to coat the copper or copper alloy surface with the best alkali-resistant paint available so that the copper alloy cannot function as a cathode. On the other hand, if only the steel surface is coated, any pinhole, uncoated edge or other holiday in the coating would become the focal point for serious galvanic corrosion of the steel.

Brazing Iron and Steel

The brazing alloys such as Manganese Bronze, Naval Bronze and Low Fuming Bronze are widely used for joining steel and cast iron for use in sodium chloride solutions. While these bronzes are susceptible in themselves to dezincification in sodium chloride solutions, the narrow band or wedge of copper brazing alloy is galvanically protected by the much larger surface of the ferrous metal without the latter showing any significant increase in corrosion.

Joining Copper Alloys

Welded joints made using low copper (high zinc) brazing alloys may be subject to rapid dezincification in sodium chloride solutions. Even joints made by welding Arsenical Admiralty with Uninhibited Admiralty Welding Rod have suffered from dezincification localized in the narrow band of welding alloy. Such localized corrosion can be avoided either by welding Arsenical Admiralty with Arsenical Admiralty Welding Rod, with Silicon Bronze Welding Rod (98% copper, 2% silicon) or with a suitable silver brazing alloy. Copper and high copper alloys (usually over 85% copper or containing a dezincification inhibitor) for use in sodium chloride solutions should be welded either with welding rod of identical composition or with the alloys just mentioned. The low copper brazing alloys or spelter solder (50% zinc and 50% copper) should be avoided for such services.

Silicon bronze bolts used to fasten together carbon steel sections exposed to sodium chloride solutions have led to no measurable increase in corrosion of the steel. Similarly, silicon bronze brazed joints (small cathodic area) in relatively large carbon steel sections have also given satisfactory results. Silicon bronze welds (made by gas and carbon arc-welding) joining deoxidized copper, red brass, silicon bronze, etc., also show no tendency toward increased corrosion due to the galvanic effect in sodium chloride solutions.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Tube Finning Machine applies fins to tubing from ¼ to 4-in. diameters for heating, cooling or air conditioning. In this size range, maker states, copper, aluminum, steel and other tubes can be finned in any metal combination. Machine operates by winding strip metal around tube on vertical axis to any desired fin spacing, to any length, and at about 10 fpm rate. **No. 1382**

Deaerator, Heater and Tank to feed small boilers has capacity to 60,000 lb per hr with oxygen less than seven ppm, manufacturer claims. Unit is factory assembled, ready for installation in either right or left hand design. Storage tank ranges from 35 to 250 cu ft. **No. 1383**

Wire and Stock Reel is clutch type with 4-in. oscillating movement in direction of pull. Limit switch stops reel if pull exceeds 4-in. Unit is available in sizes to handle 175 lb and 8-in. minimum ID, and 250 lb and 12-in. minimum ID, maker states. **No. 1384**

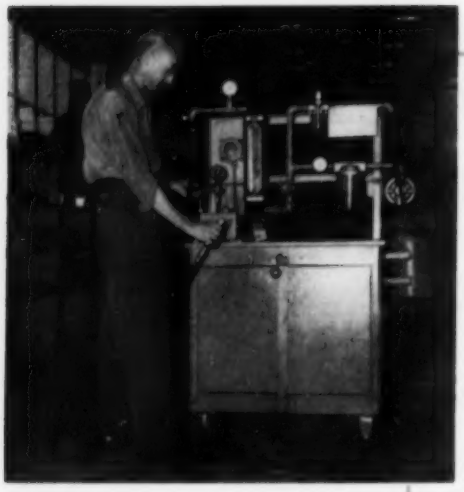
Bar and Tube Straightener for hot rolled bars and heavy wall tubing has water cooling system for high temperature operation to 400 fpm, maker claims. Tubing range is from 5/16 to 3-in. OD, and bar range is 5/16 to 2-in. OD. Five-roll straightening principle is used for reduced wear. Scale is disposed by gravity. **No. 1385**

Micrometer Caliper has friction control built into upper portion of thimble which will stop spindle advance with application of contact pressure, maker asserts. Direct-feel section of thimble is integral with spindle for sensitivity. Two models have range of 1 in. by thousandths and ten-thousandths. **No. 1386**

Rolling Machine forms material from 3 to 36 in. wide on both edges simultaneously. Identical or different rolls can be used on the two heads. Material comes out perfectly parallel, manufacturer claims, regardless of deviation in shearing. Speeds to 125 fpm are attainable. **No. 1387**

Horizontal Metal Band Saw cuts up to 8-in. round stock, 16-in. flat stock, 8-in. pipe and many shapes including very thin sections, maker states. Frame descent is correctly maintained by hydraulic mechanism; all parts are enclosed, although cutting action is easily visible to operator. Blade changes take a few seconds. **No. 1388**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL
BRIDGEPORT BRASS
BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865
Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal
Warehouse Service with Slitting Facilities in Principal Cities (Advertisement)



Ryan-designed test carts move throughout the plant to check and test the air-operated tools and lines weekly. The method locates air line losses and also keeps the tools lubricated

Table I

Percentage of Tool Efficiency

Line psi	With Old Valve and Washer	With New Valve and Washer	Percentage Efficiency Increase
95	48%	100%	108%
98	80%	100%	25%
95	6%	90%	1400%
100	27%	88%	225%
102	5%	100%	1900%
*80	25%	56%	124%
*85	41%	56%	36%

* Low line pressure

Table II

Effect of Size and Length of Hose on Tool Efficiency

Line psi	Tool Efficiency ¼" ID	Length	Tool Efficiency ⅜" ID	Length	Per Cent Increase
106	76%	12′	100%	12′	31.5%
94	33%	20′	92%	12′	178.7%
94	49%	14′	92%	12′	87.7%
98	46%	14′	90%	12′	95.6%
94	67%	8′	92%	12′	37.3%
100	36%	15′	100%	12′	177.7%

Get the Most Out of Compressed Air

. . . ALL THE TIME

Ryan took a long, hard look at its compressed air power system. Some of the results of the shakeup that followed are significant to anyone operating pneumatic equipment

HIT-AND-MISS systems for operating compressed air belie the fact that it's an often-essential and always-expensive production force. A good illustration is the $20,000 a month Ryan Aeronautical Co. is realizing from a new approach calculated to get maximum efficiency from air-operated tools, with minimum maintenance.

Ryan's program grew out of a thorough survey of all its installations, an extensive project that compared optimum maintenance and operating practices with those then in effect. The San Diego aircraft builder requires 680 hp to obtain the compressed air used by air-powered tools. These include 4000 hand-operated drilling, riveting and grinding tools, plus 95 resistance welding machines, air hammers and pressure test stations.

The economics of compressed air operation at Ryan also involves a substantial stake. The company pays more the $2 million a year just to employees using air-operated tools. It spends another $82,600 yearly for parts and labor to keep $300,000 worth of hand tools in good operating condition.

Importance of Testing—One of the first facts produced by the methods engineering department's survey was that expensive tool repairs could be avoided in almost every instance that insured regular lubrication and testing. The first hurdle, getting lubrication and testing done without disrupting production, was overcome by devising a special mobile test cart.

Equipped with test instruments and oiling devices, these carts travel through the plant to bring analytical facilities to tools in use. Every air-operated tool is tested each week. First, the tool is checked on the cart's tachometer to determine its rpm. Then, a flow meter check is made to analyze its capacity to handle cubic feet of air per minute. By harnessing the tool to a hydraulic pump that pumps oil against a pressure gage, an approximation of the power the tool develops is obtained.

Proper Lubrication—Finally, the tool is oiled. If defects show up in the tests, the tool is sent off to the repair station before the damage is extensive.

In conjunction with the company's development laboratory, a test is being conducted on the suitability of molybdenum disulphide as a tool lubricant. If this compound stands up as well as preliminary tests indicate, it will be possible to clean and relubricate tools without disassembling them.

With standard greases now used

These furnace operators

cut fuel costs, reduced cycle time with the LIGHTEST WEIGHT insulating firebrick

Here's "production-line" proof of actual savings made by replacing heavier brick with the lightest weight insulating firebrick made today—B&W IFB.

LARGE FORGE FURNACE
Comparative Furnace Tests

	Standard Firebrick	B&W IFB	Change With B&W IFB
Furnace Output, pieces per hour	70	100	Increased 43%
Heating-Up Time, minutes	210	35	Reduced 83.3%
Cycle Time, minutes	50	30	Reduced 40%

In addition:

Fuel consumption during heating up ..... Reduced 83%
Fuel consumption during operation ..... Reduced 50%

ANNEALING FURNACE
Comparative Furnace Tests

	Standard Firebrick	B&W IFB	Change With B&W IFB
Heating-Up Time, hours	52	31	Decreased 40%
Total Cycle Time, hours	131	114	Decreased 13%
Fuel Consumption, lbs./cycle	12,792	8,159	Decreased 36%
Yearly Output, tons	946	1,100	Increased 16%

MAGNESIUM MELTING CRUCIBLE FURNACE
Comparative Furnace Tests

	Ordinary Firebrick	B&W IFB	Change With B&W IFB
Fuel Consumption BTU/HR	1,000,000	500,000	Decreased 50%
Control	100 to 150 F overshoot of critical pouring temperature	no overshoot of critical pouring temperature	

What's behind these remarkable records of B&W IFB? Light weight for one—in fact B&W IFB is lighter in weight than any other insulating firebrick. This means they store and conduct less heat, provide faster heating-up time and lower fuel consumption. These brick also respond rapidly to changes in heat input, assuring excellent temperature control.

Get all the facts on B&W Insulating Firebrick from your local B&W Refractories Engineer. He may be able to point the way to lower production costs for you.

R-483

B&W REFRACTORIES PRODUCTS—B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars

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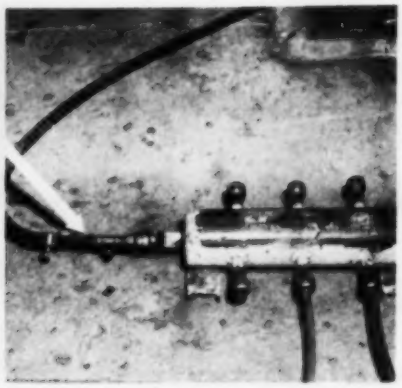
Excessively long air hoses are not only floor hazards—they sap tool power because of extra friction induced in hoses, both through coiling and length itself. In installation at right, a 20-foot hose does an 8-foot job, and inefficiency is compounded by taking hose from the bottom of the pipe to make a built-in water trap



Systematic checks will catch wasteful practices like the ¼-inch connection that restricts power being fed to six pneumatic tools from this pig, and drain cock replaced by plug to prevent drainage of component

in tool bearings, the company reports this cannot be done because the cleaning solvent washes away the lubricant.

Distributing Lines—The company's factory buildings, covering more than 750,000 sq ft, are served adequately by compressed air. The objective is to make sure that a full 90-psi pressure is brought to each hand tool—standard for this equipment. A tool will lose power if pressure drops below 80 psi, and undue wear results if pressure goes above 110 psi. Power loss can affect production materially. For instance, Ryan determined that a typical tool producing 18 parts at 90 psi could turn out only 14 in the same period when pressure dropped to 70 psi.

One of the most important aspects of the survey was determination of the relation held by fittings and hoses to tool performance. Ryan uses 3000 quick-disconnect-type fittings. These should be inspected at regular intervals. After months of service, the rubber washers and metal valves in them can become worn and greatly restrict air passage. Their effect on tool operation is shown in Table I. Pressure drop through a good quick-disconnect fitting and valve is only 3 psi or 5 per cent in tool efficiency.

Standardized Fittings—A number of instances of power loss due to improper size and length of hose used were uncovered by the study. Smallest inside diameter rubber hose recommended by air tool manufacturers is 5/16 inch. Often ¼-inch hose sizes are used and no consideration is given to lengths employed. Tests proved that as much as 1 psi per foot of hose is lost when diameters are slightly undersize. In some cases it was found that 25 feet of hose was used to serve a work station only 6 feet from the air outlet.

A gain of 2 psi was made by merely uncoiling such hose. Examples of the gains made by substituting ⅜-inch diameter hose for ¼-inch are shown in Table II.

As a direct result of its study, Ryan has standardized on use of Hansen fittings and ⅜-inch diameter hose lines of the shortest possible run to each work station. All fittings are inspected at regular intervals and worn valves and washers replaced. Tapered valves have been replaced with square shoulder valves which permit an average of 14 per cent more air to pass. Care is taken to see that no more than 10 fittings serve a ½-inch pipe inlet, and hook-ups are distributed in as balanced a manner as possible.

More Power—These steps have increased tool power as much as 200 per cent and have made more compressed air available to the plant. This may sound paradoxical in view of the fact that larger air lines require more air to keep them supplied. As a matter of fact methods engineers estimate it takes 35 per cent more compressed air to fill the system now because of the enlarged hoses and fittings.

However, with full power at each tool, the production jobs are accomplished in a fraction of the time formerly needed with the result that more air power is available to the plant.

Air Sources—Four compressor stations are located in the Ryan plant to provide necessary compressed air. Five Gardner-Denver compressors and one Worthington type are used to develop 3600 cfm at 100 psi. The survey showed that this air entered the main lines of the plant at a temperature of 100° F. As it coursed through the plant into the hand tools, it cooled, and moisture in the air condensed within the system. This water caused rust which flaked off and was blown into the tools. The moist, dirty air entering the tools removed lubricants and introduced foreign abrasive matter which contributed to excessive maintenance costs.

By improving the design and use of water trapping facilities, Ryan improved this undesirable condition. However, the survey recommended that steps be taken to remove the water from the air before it entered the distributing system. This has been done at one compressor station and is being planned for the others. A Parkhill-Wade air drier has been installed to remove the water content from the air.

All work and some play makes this a smart buy

6,000-r.p.m. wheel speed is "stopped" by 1/10,000 sec. stroboscopic exposure. (Wheel guard removed to show detail.)

Watch rough grinding problems melt away fast, *safely*...when a CARBOFLEX Depressed Center Wheel goes to work. Undercut and reduce heavy welds, rough off fins and sharp edges, notch and cut off gates and risers, remove surface defects. Breeze through *any* general purpose roughing, slotting or cut-off operation in record time...with maximum safety. CARBOFLEX Wheels by CARBORUNDUM combine extreme high strength and resistance to cracking with maximum cutting ability...give you more production at less abrasive cost. Both sides of these strong, fabric-reinforced wheels are knurled. Cut with either side plus the edge. Call your CARBORUNDUM Distributor or Salesman today for a demonstration of this new cost-cutter.

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We put our knows to your grindstone

Three to five years of research, engineering and testing go into the development of a new grinding wheel by CARBORUNDUM . . . as much as you'll find behind any other precision machine tool in your shop. New resinoid bonds present tricky engineering problems. The bond is the "tool holder" of the grinding wheel . . . differs only in that it must automatically release dull or broken grains so that new ones can take over the cutting. New resins are under constant test in CARBORUNDUM's laboratories. Some will become bonds in wheels designed for tomorrow's grinding machines. Meanwhile, your CARBORUNDUM Distributor or Salesman offers a complete line of fast, cool-cutting wheels for today's precision needs. Call him—right now!

Through product quality and application "know-how"

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Carbide Slows Tool Wear

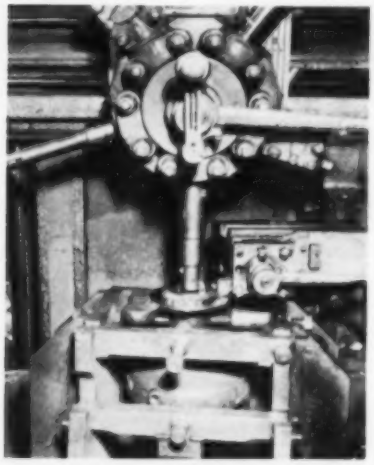
CHILLED SPOTS with sand occlusions on a part for a fork lift truck made of irregular cast steel, can play havoc with tool life. At Yale & Towne Mfg. Co., Philadelphia, rapid wearing of tools stopped when Carboloy grade 370 cemented carbide was applied to the job.

Machine downtime was substantially reduced, and tool life was extended almost 40 per cent in the process. On the same casting, tool life on a plunge facing operation was multiplied five times by use of the new grade.

No Coolant—First job required outside diameter cuts on a banjo housing varying from 3 to 8 inches, with a corresponding surface speed variation from 200 to 500 sfm. Cuts from ¼ to 3/16-inch were taken at a feed of 0.010-inch, both interrupted outside diameter and facing, on a 36-inch Bullard vertical turret lathe. Cuts were made without coolant with a standard Carboloy tool, tipped with grade 370.

Tools formerly had to be returned to the grinding room after 24 rims. Use of the new tool raised production to 34 pieces per grind with a corresponding decrease in machine downtime for tool changes.

Plunge facing involving two simultaneous interrupted cuts on this casting was also taking a heavy toll on cutting edges. Production per tool grind was raised from 3 to 15 cuts.



TOOL LIFE MULTIPLIED
. . . on plunge facing, 5 times

MACHINE TOPICS

BY R. F. HUBER, *MACHINE TOOL EDITOR*

GOVERNMENT activities will continue to be critical for the machine tool builders. A complete session of the recent spring meeting of the National Machine Tool Builders' Association was devoted to industry problems as related to government.

One of the most important items, and one of the brightest pictures, is the House bill HR 8300 which provides for accelerated depreciation of capital equipment.

Right Idea—Having recommended optional depreciation, machine builders aren't entirely satisfied with section 167 of HR 8300. But, they hasten to add, it's certainly a step in the right direction.

New bill provides that taxpayers may adopt a declining-balance method of computing depreciation. This will enable them to recover about two-thirds of the cost of a machine within the first half of its useful life, as determined by the Internal Revenue Department.

An alternative method which has been proposed is the "sum of the digits" system. Big difference between the two systems it that the latter would have a terminal date, which would permit complete writeoff.

Investment Boost—Faster writeoff will make it easier for machine tool users to replace obsolescent equipment. There is a reluctance on the part of businessmen to replace assets before they are fully depreciated on the books. George Terborgh, in his book, *Dynamic Equipment Policy*, says: "Right or wrong, rational or irrational, this prejudice exists in many places and must be reckoned with. It means that a depreciation policy which yields a retarded writeoff of capital assets is conducive to tardy replacement."

Speaking to the New England Council Industrial Opportunity Conference in Boston, A. V. Bodine, president, Bodine Corp., Bridgeport, Conn., said: "Industrialists need no incentive to modernize. They would all like to keep their plants modern. They know that if they don't, under our competitive system, sooner or later they will go out of business. The reason they don't modernize fast enough today is that they are punished for it." Mr. Bodine points out that it's not a question of "incentive taxation" to stimulate buying. It simply amounts to removing the penalty that has prevented this buying.

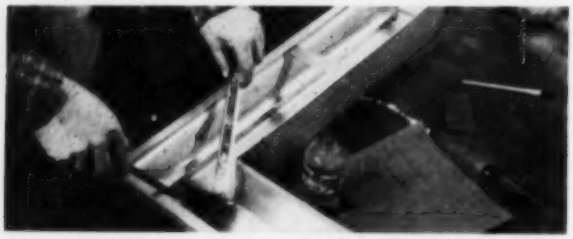
Notes and Tips

This year's advertising awards for the builders' association went to: Monarch Machine Tool Co., Sidney, O., New Britain Machine Co., New Britain, Conn., and Warner & Swasey Co., Cleveland, for a circular describing one machine. For a catalog describing a particular line of machines, awards were given to: New Britain Machine Tool Co., Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., Warner & Swasey Co. and Lodge & Shipley Co., Cincinnati.

For a condensed catalog describing an entire line, awards went to Kearney & Trecker Corp., Milwaukee, Monarch Machine Tool Co. and Giddings & Lewis Machine Tool Co.

Before soldering, roughen stainless steel joint with emery paper or abrasive wheel so flux will wet the surface. Clean thoroughly, then apply stainless flux. For strong joints, the solder should be at least 50 per cent tin

Always wash soldered joints and adjacent areas. Use ammonia water or a solution of laundry soap, washing soda and water. Then scrub thoroughly with clear water. This is necessary to remove excess acids, prevent corrosion



Tin or coat edges to be joined with a thin film of solder. Then apply solder with a large iron, quickly flowing solder into the joint. Stainless conducts heat slowly, requires a large soldering iron and longer time

A fast and efficient way to join cast stainless lug to a formed stainless steel frame of a filter leaf screen. The operator is using an acetylene torch with 50-50 flux and completes the joint, with fluxing, in a minute

how to SOLDER stainless steel

STAINLESS STEELS are soft-soldered readily to make tightly-sealed joints. Naturally, such a joint is no stronger than the strength of the solder alone. Tensile strengths of the solders are about 7000 psi, while tensile strengths of the stainless steels on which they are used are 85,000 psi or higher.

To prepare the joint surface, clean thoroughly and roughen to produce uniform adhesion. Pickled finishes need only to be cleaned before fluxing. Cold rolled or polished finishes, No. 4 or higher, must be roughened. The job can be done with file, emery cloth or abrasive wheel.

Do's and Don'ts—A 70 per cent tin, 30 per cent lead solder will produce smooth, strong, bright joints with adequate corrosion resistance and less discoloration of adjacent metal. Do not use soft solders of less than 50 per cent tin because of reduction of fluid and the fact that they tend to darken on exposure to atmosphere.

Stronger fluxes are required to cut through the chromium oxide surface film on stainless steels and etch the metal underneath. Any number of excellent commercial fluxes may be used; or ortho-phosphoric acid and cut muriatic acid are satisfactory. When applying flux, use a small brush to keep liquid confined within the soldering area.

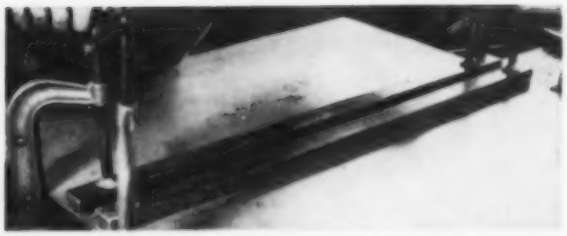
Technique—Best practice is to tin or coat edges to be joined with a thin film of solder. The solder flows more freely and assures better penetration. Where many parts are to be etched at one time and later soldered, tinning keeps the edges clean.

Use a large soldering iron and flow the solder quickly into the joint. Stainless steel conducts heat slowly and it takes longer to heat the joint to proper soldering temperature. However, temperatures higher than those required to melt and flow the solder are not needed and should not be used.

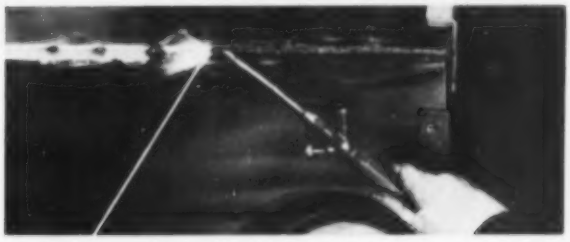
For sweat soldering, employ the same preparation, fluxes and solders as for soft soldering.

Soap and Water — Immediately after soldering, it is important to wash the joint thoroughly with ammonia water or laundry soap and water in which caustic soda has been dissolved. Then rinse with clear water to neutralize and remove injurious excess acid and salts.

Welding stainless is different from mild steel. Type 302 has 50 per cent more heat expansion, only one-third the conductivity. Welds are stronger, show greater ductility



Use heat dispersing jigs in all stainless welding. Jigs are needed for alignment; they prevent distortion, remove excess heat. This is important with the type 430



Oxyacetylene welding causes more distortion than other methods. With 14-gage or heavier, joint spacing should equal thickness of metal. Use butt joints on 16-gage through 20-gage; flange butt weld on 22-gage or lighter

Metal arc is used on stainless sheets 20-gage and heavier. On 20 through 16-gage, butt edges tightly; on heavier gages, space edges about metal thickness apart. Flux-coated type 308 rods are best, but be sure arc is short

how to WELD stainless steel

You can weld or solder stainless steel with the same equipment you use for carbon steel. But, like any other metal, stainless has special characteristics. Here they are—and here are Armco's tips on what to do about them

TO WELD the chrome-nickel grades of stainless steel, keep in mind they have a coefficient of expansion about 50 per cent higher than mild steel, and about a third the heat conductivity. To prevent warpage, use a planned sequence of welding operations, jigs or other efficient means of drawing off heat.

Coefficients of expansion of the chromium grades are about 10 per cent less than mild steel and they have about half the heat conductivity.

Distortion may occur unless controlled. Copper chill plates placed near the weld zone help dissipate heat and prevent distortion from excessive expansion.

Proper Jigging Essential — Use rigid jigs or fixtures to hold welded parts in correct alignment. Proper cooling of the assembly in the fixture reduces warpage greatly. Otherwise, tack-weld every one or two inches and peen welds that reveal marked shrinkage. Straighten the joint and proceed with finish welding. Skip welding and step back welding frequently are employed on complicated assemblies.

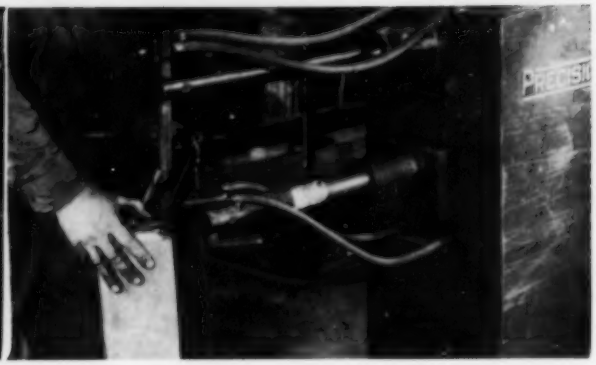
Oxyacetylene welding is used more generally for welding 20-gage and lighter stainless sheets than heavier gages and sections. First step is to clean all edges to be joined. Use uncoated or bare rods with diameter about equal that of sheet thickness. For service at normal temperatures, chromium-nickel rods produce a more ductile joint than chromium rods.

Space abutting edges of 14-gage sheets and heavier a thickness of metal apart. Gages 16 through 20 should be butted together. Flange butt weld is recommended for gages 22 and lighter, flanged to height of about $\frac{1}{16}$-inch. But, without spacing, use of filler rod is unnecessary.

Flames and Fluxes — Neutral flame is best, but a slightly reducing flame is more practicable. Proper adjustment is necessary to obtain this condition. Too much oxygen will oxidize the metal. Too much on the reducing side will carburize the weld, make it brittle. Use burner tip one to two sizes smaller than required for same gage of mild steel.

Special flux must be used to gas-weld stainless steels. Common practice is to apply flux with a small brush to cover all surfaces ready for joining. There are other methods, such as fluxing only back side of weld or brushing a thin

Inert gas shielded arc welding is excellent for stainless up to ¼-inch thick. Filler rods are not usually needed. Torch uses tungsten electrodes, with edges butted and fused. Small, clean bead keeps finishing costs low



Low heat input makes spot welding excellent where lapped joints are permitted. It works best with high welding pressures at low heat and shorter weld timing than is used for a comparable cold-rolled steel sheet thickness

paste of flux on the bare rod.

Knitting motion of the torch is preferred. Avoid puddling the pool of weld metal with the rod. Hold rod in flame at all times, completing weld in one pass. Metal arc welding is faster and produces less buckling on 20-gage sheets and heavier. But in light-gage work, control is difficult and too much heat may melt holes in the metal.

Electrodes — Flux-coated electrodes should be used to protect molten metal from air. It helps to maintain a steady arc with even metal flow into shielded area. Brush slag from surface before following beads are laid when welding ¼-inch and heavier stainless. When porous welds are caused by moisture in electrode coating, bake electrodes briefly at 200° F.

Procedures — Arc welding stainless sheets and light plates employs both alternating and direct current. Reversed polarity produces deeper weld penetration and more consistent fusion with direct current. At least 20 per cent less current is advised than for mild steel. Make sure work is free of scale, grease and dirt.

Procedure generally is the same as in arc welding carbon steel. Square the edges and place polished side down. Before striking arc, remove a little coating from tip of flux-coated electrode. Keep arc short and avoid excessive weaving. In more than one-pass welding (¼-inch and heavier) clean slag from previous bead head before laying another next to it.

Inert gas shielded arc welding is being used more and more for welding stainless steel sheets ¼-inch and lighter. Its chief advantages are no need for flux, and filler rods usually are not required. Edges simply are butted and fused, which means important savings in weld bead grinding. Existing welding equipment frequently can be adapted readily to this method.

Machine Setup — To set up machines for spot and seam welding, remember that somewhat lower current and shorter "on" time are required. Reason is greater electrical resistance of stainless.

Stainless requires almost twice as much electrode force as low-carbon steel of equal thickness. Use water-cooled electrode tips to dissipate heat quickly.

WELDING REFERENCE TABLE

	Rod Size Diam. Inches	Edge Spacing	Type of Rod	Flux
OXY-ACETYLENE				
18 gage and lighter	1/16	On 22-gage and lighter, use flange butt. 16 through 20 gage, butt edges. 14 gage and heavier, space sheets metal thickness apart.	Bare (Uncoated)	Flux required. See Mfrs. recommendations for Oxy-Acetylene welding of stainless.
18 to 16 gage	1/16 to 3/32			
16 to 10 gage	3/32 to 1/8			
10 gage to 3/16-inch	1/8 to 3/32			
¼-inch and heavier	3/16 to ¼			
METAL ARC				
20 gage	1/32	On butt welds, 18 gage and lighter, butt the edges. Heavier gages, space metal thickness apart.	Coated Rods	Use flux-coated rods
18 gage	3/64			
14 gage	1/32			
⅛-inch	1/8			
INERT GAS-SHIELDED ARC	Where needed, use rods about equal to metal thickness.	Usually butted. Lighter gages may be flange butted.	Not usually needed. If so, use bare rods.	None

MACHINES *and tools* for coordinated production from blank to finished gear... that is the Fellows Method. In capacities for cutting gears from 1/16″ to 120 inches, Fellows machines tooled with Original Fellows Cutters provide unified responsibility—a great practical advantage in the control of cost and quality. Fellows Sales and Engineering Staffs are nearby at your service.

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at Low Cost

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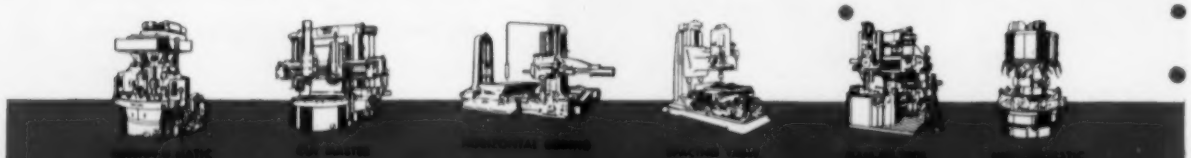
At Phillips Machine Shop in Alliance, Ohio, they rely on Bullard Horizontal Boring, Milling and Drilling Machines. They do general machine work for a number of major manufacturers in this highly industrialized northern Ohio area.

"I choose Bullard," says Mr. Donald Phillips, owner, "because it is the best boring mill on the market. I have carefully checked other domestic and foreign makes. None of them have the weight, the solidity and the reliability of the Bullard machine."

Investigate BULLARD — if you're looking for a versatile, rugged horizontal boring, milling and drilling machine with "built-in" accuracy and efficiency. Have your Bullard representative explain its many features or write to



THE BULLARD COMPANY · BRIDGEPORT 2, CONN. Telephone 6-2511

Trucks Shoulder Large Load in Small Plants

A SMALL nonintegrated plant makes it tough on mechanical handling equipment. For instance, lift trucks usually have a multitude of drivers, carry an endless assortment of loads over varied floor and ground surfaces and can almost never be out of service.

A good example is found in a Los Angeles scrap metal operation where a pair of Hyster trucks have made themselves essential. One truck, a YT-40 with dual steering wheels, works at ground level on general handling jobs that include car and truck loading and unloading, stacking in the yard and on docks.

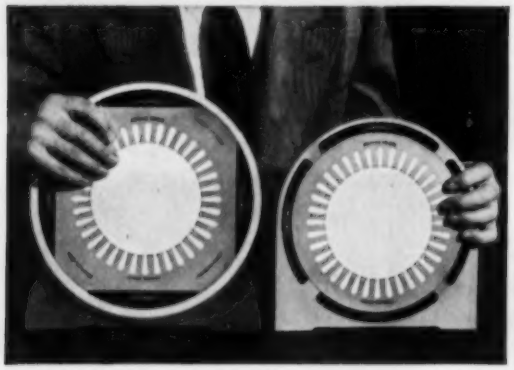
The second truck works in the plant on almost a 24-hour-a-day schedule. At night, the truck positions 25 tons of brass scrap beside two melting furnaces. In addition, it unloads scrap lead from highway trucks and supplies the lead furnace, moves boxes of lead oxide to the slag furnace, stacks boxes and drums of all types of scrap and handles loads of pig lead to the dock for highway truck loading.

Type of terrain over which this truck must travel would swamp most equipment. Trucks are in the 4000-pound class, and loads are kept at about 3000-pound maximum. This includes loads of pig lead with short center of gravity

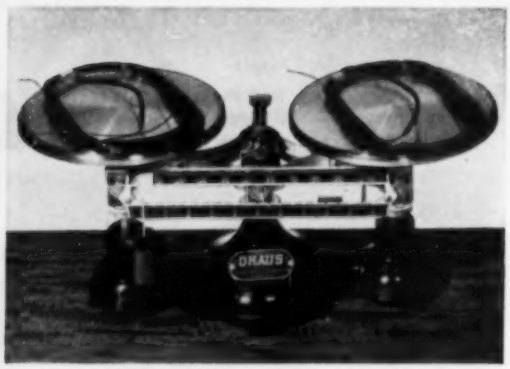
Simple adjustment of fork spacing means a truck can go from a job unloading boxes containing scrap battery plates (above) to loading stacked lead pigs (below)

Truck must negotiate narrow aisles, short turns, uneven surfaces cluttered with pieces of scrap. This lift stays at its outdoor job an average of about 6 hours each day

Here are laminations from two 5-hp Life-Line motors. Note that only the inactive support corners of the original Life-Line square stator have been eliminated from the round stator of the Life-Line "A" motor.



When the stators are placed in their respective frames we see how the Life-Line "A" size reduction has been accomplished without sacrificing active magnetic steel. Excess air space has been eliminated also.



Copper, the other important active material, has not been sacrificed. The coil on the left is from an original Life-Line motor. The coil on the right is from a new Life-Line "A" motor. Both weigh the same.

Here's how more horsepower has been put in the Life-Line A motor

These demonstrations show how motor performance is determined by "active" material

Perhaps you are a motor user who has raised the question: "How can you shrink the size of a motor and still equal or better the original performance?" Let's look inside a motor to find the answer.

The performance of any motor is dependent upon its active material—the magnetic steel and copper. Take the original Life-Line® and the new Life-Line "A" for example. The amount of magnetic steel in the stator and rotor and the copper in the coils of both Life-Line designs are the same. The reduction in size has been accomplished by eliminating inactive material and space. Thus you have a smaller motor whose basic electrical performance remains unchanged. In fact, the Life-Line design principle has been proved in service for over seven years.

J-21848

For the complete story on the new Life-Line "A" motor write for your copy of Booklet B-6154. Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

YOU CAN BE **SURE**...IF IT'S

Westinghouse

Filter serving Bullard six-spindle Mult-au-matic used on cylinder bores. Chips are from cast aluminum heads. Required coolant flow: 35 to 40 gpm

. . . supplying needs of six Waterbury Hall AW grinders

Translate . . . . .

By GEORGE L. GUYMON
Vice President and Director of Sales
Industrial Filtration Co.
Lebanon, Ind.

A thorough analysis by Continental Motors' Military Division revealed an annual $289,500 saving from 165 filtering units. Once-a-week tank cleaning is one reason

GOOD COOLANT filtration can be translated directly to significant operating cost reduction. A report compiled by the plant engineering department of Continental Motors Corp.'s Military Division emphasizes this fact in a dollars-and-cents account.

Analysis of work at the Muskegon, Mich., facility is compiled on operation of 165 filtering units installed on machines having heavy sludge return and coolant and cutting oil usage. A total of 240 Delpark coolant and cutting oil filters now serves practically every major American-made machine tool where coolants and cutting oils are used, and in various filtration applications at Continental.

Coolants — Types of coolants used in the machines and equipment vary with requirements of the operations, based on finished, lubricating qualities and friction heat transfer properties. Work includes removing from 0.0005-inch to 0.040-inch of stock from parts made of steel and aluminum castings, forgings and bar stocks.

Due to the many types and mixtures of coolants used, coolant and labor saving for mixing and preparation is estimated conservatively at $71,000 per year. Coolant savings amount to $50,000 of this total. This can be broken down to specific coolants on certain jobs. For example, savings in the use of Vantrol (oil) on connecting rod broaches amounts to $1800 a month or $21,600 a year on two machines.

Tank Cleaning—Before installation of Delpark filters, coolant tanks on all 165 grinders had to be cleaned once, and in many instances twice, on each shift. To clean the average coolant tank in such an operation requires pumping out the coolant and disposing of it, cleaning out all sludge, cleaning the pump—and lines in some cases—then replacing with new, clean coolant and cleaning up around the machine.

Cleaning a tank in this manner requires an average 1.2 manhours. Each tank would average two cleanings a day for a total of 2.4 manhours per machine. This would mean a saving on 165 machines of about 396 manhours per day, or 1980 hours for a five-day week.

. . . removing chips from coolant for Snyder Automatic

. . . removing fine swarf in coolant from J & L grinder

COOLANT FILTRATION *Into Dollars*

Since the filter installation, these machines have coolant pumped out once each week on the average. This includes disposing of sludge and shavings running off the end of the filter into pans. It leaves a net average of 366 manhours per week saved. Dollar difference in labor each week is $2744, or about $145,000 per year.

Maintenance—Savings in some cases have been tremendous; in others, it balances cost of operating the filter. However, in the latter case, main concern is to reduce maintenance on the machine and its component equipment. Maintenance cost for coolant pumps and systems, electrical operating mechanism and fixture bushings and other moving parts through or on which coolant passes has been minimized. A conservative estimate for machines covered would result in a savings on maintenance labor of $380 a week, or about $19,000 a year.

Savings on machine replacement parts such as coolant pumps, fixture bushings and guides, coolant lines, packing glands, etc., average $85 a week.

Tool and Grinding Wheel—Before installation of filters, grinding wheels were dressed four to eight times an hour. They are now dressed once or twice an hour, depending on finish and wheel loading requirements which, in addition to wheel savings, automatically improves quality of parts.

A savings in tooling is effected because friction producing sludge is no longer carried back over the tools. Grinding wheel and tooling savings are conservatively estimated at $50,000 a year.

Filter Functions—The Delpark coolant filter is a continuous, self-cleaning gravity unit. It filters solids from liquids that will flow, by gravity, through filter material and discharges the solids, in a relatively dry state, into an outside container. Filter material, fed from a roll, rests on and conforms to a flat endless conveyor of open construction. Sloping sides form a shallow pool of the conveyor and an inclined discharge ramp provides for removal of filtered solids.

Dirt-laden liquid is fed onto the filter material, liquids pass through, and solids remain on the surface of the filter material. When flow through the filter material is reduced by solids held on it, liquid level rises. This action raises a float which actuates a switch, causing the conveyor to carry the filter material forward to discharge accumulated solids and bring clean filtering material under incoming dirty liquid.

Float drops as level of liquid lowers, conveyor stops until need for clean filter material again causes liquid level to rise and the cycle is repeated.

SUMMARY OF SAVINGS

Due to reductions in maintenance labor	$ 19,000
On replacement parts	4,500
On labor of cleaning tanks	145,000
On coolants and mixing of coolants	71,000
On grinding wheels and tools	50,000
Total Gross Savings	**$289,500**

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- **ON ZINC AND CADMIUM** you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.
- **ON COPPER . . .** Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.
- **ON ALUMINUM** Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.
- **ON MAGNESIUM** Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

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Cold Drawing Seamless

Tungsten-titanium carbide mandrels have saved $5000 on this steel tube drawing job

REDUCED mandrel costs, with elimination of practically all tube scrappage, is being realized by a midwestern fabricator by a switch from chrome-plated steel mandrels to those of tungsten-titanium carbide for cold drawing seamless steel tubing.

Their operation consists of reducing 1½-inch diameter by 0.083-inch wall SAE 1010 steel tubing to 1-5/16-inch diameter with 0.063-inch wall. Tube length when brought to the draw bench is 9 feet

After drawing 440,435 feet, the K-84 mandrel nib showed 0.003inch wear. Cost: About 1/10 cent per hundred ft

8 inches. After processing, length is 15 feet 9 inches. Both outside and inside diameters of the tubing are held to tolerances of +0.001, −0.005-inch.

Drawing Costs Reduced — Average draw-life of previous chrome-plated mandrels and others made of standard carbide material was only about 500 feet. Since chrome mandrels cost about $2 each, mandrel cost per foot of tubing produced was $0.004, or 40c per 100 feet.

At the time of the fabricator's last report, their K-84 mandrel nib manufactured by Kennametal Inc. had drawn 440,435 feet, showing only 0.003-inch wear. Cost is only about 1/10 cent per hundred feet. To date their carbide nibs have provided a savings of over $5000. Additional production savings are also obtained as a result of minimized machine-downtime required for mandrel changing.

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SPEED TREAT — a medium carbon free machining open hearth steel

SPEED ALLOY — a chromium alloy steel

briefly they

- ✓ are easy to heat-treat
- ✓ are fast machining
- ✓ give longer tool life
- ✓ produce better finishes

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☐ Bridgeport, Conn.	Bridgeport Steel Co.
☐ Buffalo, N. Y.	Beals, McCarthy & Rogers
☐ Cambridge (Boston), Mass.	Brown Wales Co.
☐ Chicago, Ill.	W. J. Holliday & Co., Inc.
☐ Dallas, Tex.	Earle M. Jorgensen Co.
☐ Detroit, Mich.	Peninsular Steel Co.
☐ Hammond, Ind.	W. J. Holliday & Co., Inc.
☐ Hartford, Conn.	Brown Wales Co.
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☐ Los Angeles, Cal.	Earle M. Jorgensen Co.
☐ Memphis, Tenn.	Pidgeon-Thomas Iron Co.
☐ Montreal, Quebec	Peckover's, Ltd.
☐ Newark (New York), N. J.	Grammer, Dempsey & Hudson, Inc.
☐ Oakland (San Francisco), Cal.	Earle M. Jorgensen Co.
☐ Paterson, N. J.	Passaic County Steel Service, Inc.
☐ Philadelphia, Pa.	Horace T. Potts Co.
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Acid Fumes—Eliminate acid fumes by installing Troxide which is a granular dry salt acid containing inhibitors.

Corrosion—Eliminate corrosion to pickling equipment and surrounding equipment. Reduce duct work and blowers.

Safety—Eliminate hazards of handling liquid acids. Troxide can be handled with no safety equipment.

Storage—Eliminate carboy storage problems. Troxide is packed in 400 pound fiber drums. Reduce freight charges.

Disposal—Eliminate acid disposal and stream pollution. Troxide solutions have gone as long as two years before dumping.

Performance—Troxide salts, when dissolved in water, react similarly to Sulfuric Acid for pickling scale, rust and oxides from metals. Troxide produces uniform pickling either etching or non-etching—depending upon type used. The pickled surface is clean and bright. An excellent base for bonding plated deposits, vitreous enamels or organic coatings.

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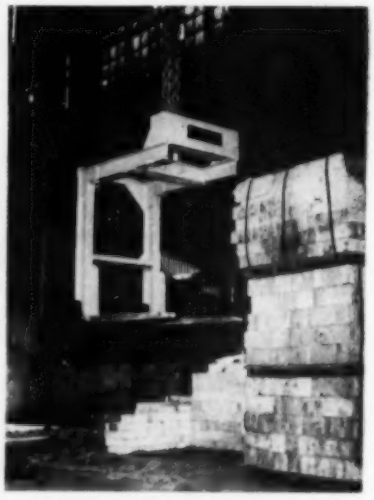
Hook Lifts Loaded Pallet

A BRICK HANDLING problem existing in the open hearth department of Heppenstall Co.'s Pittsburgh plant has been solved with the use of a specially-designed pallet lifter.

Formerly the bricks were received in carload lots without being palletized. Six laborers unloaded a car and piled the brick in the storage area. When the brick was required at the furnaces, it was necessary to load it by hand into a metal box, then transport this box by overhead crane to the job site on the floor.

Brick is now received on pallets and the cars are unloaded by fork



PALLET HANDLES BRICK
. . . capacity up to 5000 pounds

truck and placed in the storage area in a fraction of the time formerly required. When brick is needed at the furnace, it can be delivered quickly by an overhead crane using the new pallet lifter.

Here's the Scoop—The lifter is based on the principle of C hooks used in steel mills to lift coils and other heavy loads. The hook is designed to retain its accurate balance with or without a load, so that the load's weight holds it in place as it is lifted from one location to another.

All that is necessary is to slide the lower arms of the hook under the pallet. Pallet and load then can be safely transported between any two points within crane's range.

NEW PRODUCTS and equipment

Reply card on page 133 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Centerless Grinder

. . . for production basis

The No. 12½ model centerless grinder is a heavy duty type which grinds parts to close tolerances on a high production basis. Automatic loaders and automatic

cycles can be used for production of parts by either infeed or thrufeed method.

This grinder will grind work pieces with a maximum diameter of 6 inches. Maximum grinding wheel width is 10 inches. An outstanding feature is pressure lubrication for the grinding wheel spindle bearings. Landis Tool Co.

FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

Color Thermometer

. . . pigments reflect degrees

Bryson Oil Co. has become exclusive U. S. distributor for the line of temperature-testing pigments and crayons made by A. W. Faber-Castell in Germany. Thermocolor brands are a series of temperature-indicating pigments which change original color when certain temperatures are reached. Changes are not merely into shades of original color, but are definite and distinctly visible. At present 17 single change brands are available; 13 brands have two, three or four color changes.

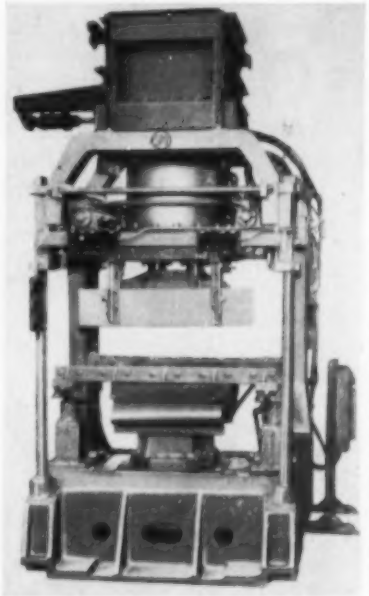
Thermochrom sticks are colored crayons whose marks also change color under influence of certain temperatures. Color change permits temperatures between 149 and 1238° F, in 15 stages, to be determined immediately and without recourse to any further agency. Bryson Oil Co.

FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Molding Machine

. . . modernizes foundries

Model No. 2302 semiautomatic jolt-squeeze-strip roll-on roll-off molding machine is designed for



foundries whose plant conditions or production volume do not permit the use of full automation. High-speed production can be achieved without extensive changes in existing facilities.

Machine features overhead squeeze cylinder, sand metering device, simplified electrical controls and the patented SPO inverted jolt mechanism. Operations are pushbutton controlled. Squeeze capacity is 57,000 pounds; jolt capacity, 4000 pounds. SPO Inc.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Sample Box

. . . parts by cold-flow

Availability of a sample box containing two of the thousands of parts produced by the Cold-Flow technique is announced.

A terminal post and contact point of brass illustrate the ad-

vantages that can be secured with this method. It's available without cost. Camcar Screw & Mfg. Corp.

FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

Air-Drying Oil

. . . protects wood, metal

Penetrol, a clear air-drying oil for protecting metal and wood surfaces against rust, corrosion, paint peeling, etc., is now available in half-pints and aerosol containers.

The product fortifies paint used on wood surfaces where it reduces

paint peeling and eliminates discoloration from rusting nail heads. It also acts as a cleaner and pro-

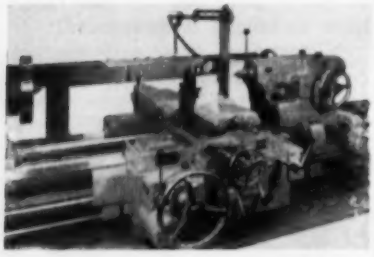
tector for chrome, brass, copper and aluminum. It can be used to stop rust action without removing the rust. Flood Co.

FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

Boring, Turning Lathe

. . . for irregular contours

A combination lathe bores and turns workpieces having irregular contours as deep as 8 inches on a side. The basis of the machine is the 25-inch American 50-hp Pacemaker equipped with hydraulically-actuated cross slide which



follows the contour of the flat work template causing the cutting tool to reproduce the template shape on the work.

Interchangeable boring and turning rests are furnished providing for rapid changeover from boring to turning, and vice versa. American Tool Works Co.

FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

Groove Gage

. . . light weight, balanced

Diameters of internal grooves such as those for O rings, snap rings, truarc, etc., are measured swiftly and accurately with Federal's new gage.

The Model 99P (ID Groove Gage) has a wide capacity and is adjustable to measure groove diameters between 0.725 and 2.625 inch. Contacts are located at the extreme ends of the gage arms. Reference or fixed contact is on the lower arm. Frame is aluminum casting, lightweight and well-balanced. A pistol grip handle

and easy-to-reach trigger make it a convenient gage to handle. Federal Products Corp.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Aluminum Cable Connector

. . . allows interchange

Interchangeable use of aluminum and copper electrical conductors in switch and control equipment is possible by use of an adapter made in straight and right-angle types for No. 4 and No. 2 stranded aluminum cable.

Made from a tin-plated copper alloy, the adapter is designed to combine electrical conductivity with springiness. It has a round barrel from which extends a

smaller, split cylinder called a tang. Barrel fits on the cable and tang is inserted under the equipment clamp. The slot that splits the tang extends well into the barrel, forming two legs. Thomas & Betts Co.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Center Reamers

. . . sets to three angles

High-speed center reamers or countersinks with 90, 100 and 120-degree included angles are now being furnished at regular prices. Previously only 60 and 82-degree units were standard. Sizes include ¼-inch to ¾-inch diameter inclusive, by ⅛'s.

Sixty and 82-degree included angle countersinks in high speed

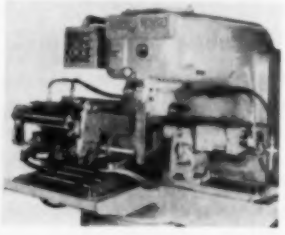
and carbon steel are also available in sets. Whitman & Barnes, division of United Drill & Tool Corp.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Automatic Loader

. . . built-in gaging device

A new type of Red Ring automatic loader for handling long-shaft, unsymmetrical gears on standard rotary shaving machines has a built-in gaging device, magazine feed, air-powered loading fingers and a discharge chute that feeds finish-shaved parts to unloading position in front of the operator.



A specially designed set of lever-type trip fingers in both input magazine and discharge chute

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In Electrode
Protection...

the new Arcos

ELECTROPAK

gives you all the packaging advantages you want

The unique construction of this packaging method was first developed for shipping wartime materials. From the arctic to the equator it provides excellent protection against weather damage and rough handling. Its *new* application by Arcos makes it the *most modern protective package yet devised* for electrodes.

EASY TO OPEN

Just strip the tape and lift the metal lid. No cutting or "breaking open."

EASY TO CLOSE

Simply push the lid on again. Its recessed rim provides a tight closure against moisture.

PREVENTS MOISTURE PICKUP

Between the outer and inside walls is sandwiched a sheet of aluminum foil. This, plus an outer aluminum foil wrap and alternating layers of ammunition board and asphalt provides an excellent vapor barrier seal.

PREVENTS CHIPPED COATINGS

In addition to its strength, ammunition board is also resilient, thus providing a cushion to prevent chipping.

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CLEAN, UNIFORM BILLETS–STRIP–RECTANGULAR, ROUND, FLAT RODS

TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

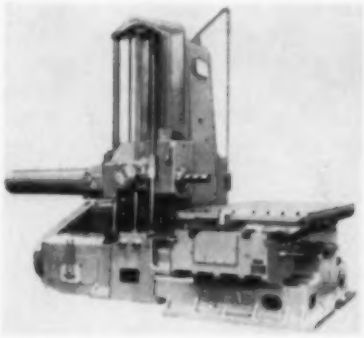
keeps the gears from touching and avoid the cocking parts. National Broach & Machine Co.

FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

Precision Boring Machine

. . . of space saving design

Lucas Machine Division offers an addition to the conventional type horizontal boring machine—a compact, rugged, short-bed-length machine without backrest.



Space-saving design incorporates all the modern operational advantages of the standard line of Lucas machines including: Electric pendant control of spindle rotation and feed-rapid traverse operations; wide, integrally cast, four-way bed to support table and saddle for long cross travel work. New Britain Machine Co.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

Hydraulic Tracer

. . . attachment converts

This hydraulic tracer attachment converts Axelson's general-purpose lathes into contouring production machines.

Initial installation is a matter of a few hours, and reverting to a standard lathe takes only 15 minutes, with no special skill or training required for operation. The unit is built ruggedly and does not restrict swing or capacity of the lathe, yet takes full advantage of the speed and power of the lathe to take heavy roughing cuts or fine precision finishing cuts. Set-up from one job to another is fast. Axelson Mfg. Co. Division, Pressed Steel Car Co. Inc.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

Hydraulic Surface Grinder

. . . to hand feed in seconds

Boyar-Schultz' 6 x 12 surface grinder is now available with hydraulic longitudinal action.

A new hydraulic valve, designed and developed by them, is said to afford perfect reciprocating move-

ment. It can be changed from hydraulic to hand feed and return in a few seconds. Boyar-Schultz Corp.

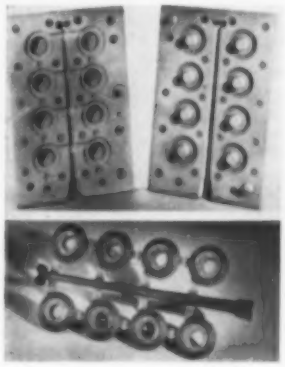
FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

Pre-Coating Sand

. . . with phenolic resin

A process using a resin-sand mix that will enable foundrymen to form a strong, lightweight shell mold which produces closer tolerances with less metal, less machining and fewer rejects is announced by Bakelite Co.

The process coats each sand particle with a thin layer of resin, made possible in the molten state by use of phenolic resin BRQ-12244. It is produced in a granular form and is non-heat-reactive. Coated sand is then dried to a freely-pourable state and can be



stored for later use. Bakelite Co., division of Union Carbide & Carbon Corp.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

Magnesium Silicate

. . . for aqueous systems

A new product, useful as a gelling agent for all types of aqueous systems, is a highly beneficiated hydrous magnesium silicate of milky-white color. Ben-A-Gel is used to thicken water solutions or emulsions. It has other applications where permanent thickening or suspension is required.

Gelling action requires only 1 to 5 per cent based on the water content and is unaffected by heat or aging. Permanent gelling is obtained by mixing it in a water system by high-speed stirring. National Lead Co.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

Belt Drive

. . . broadens speed range

A V-belt drive arrangement for broadening spindle speed range and versatility of its standard air-

hydraulic drill units is introduced by Drill Unit Division.

The accessory includes cast iron pulley guards and a motor plate

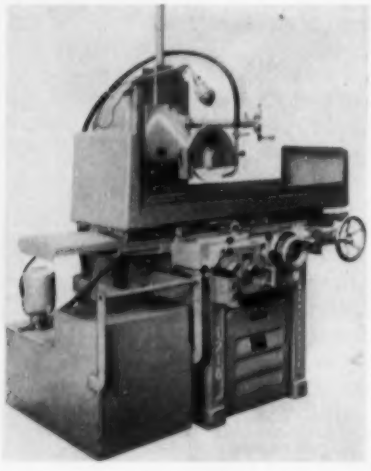
which accommodates standard NEMA rigid-mounted motors. This drive arrangement brings the unit into complete compliance with Joint Industrial Commission machine building specifications. Using standard four-step dynamically balanced pulleys, the accessory makes it possible to obtain 24 different spindle speeds. With an 1800-rpm motor, the range is 590 to 5000 rpm; with a 3450-rpm motor, it is 1180 to 10,000 rpm. Rockwell Mfg. Co.

FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Surface Grinder

. . . with backlash eliminator

An important feature of the 1218 Hydrabrasive surface grinder is the cross feed backlash eliminator. Precision transverse adjustments may be made without backlash error. Backlash eliminator works in combination with the saddle ball ways to insure that



a movement of 0.0001 inch on the cross feed dial equals 0.0001 inch movement of the saddle, regardless of which direction the adjustment is made.

Cross feed hand wheel is equipped with a large diameter barrel and easy-to-read vernier. Abrasive Machine Tool Co.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

Hopper Rack

. . . allows many combinations

A new rack and lid combination will convert standard NesTier materials handling boxes into small parts hoppers for use in assembly and production operations.

Available in two sizes, the all-welded heavy gage steel units utilize standard No. 120 and No. 175 NesTier boxes to provide a

wide range of combinations. Easy to handle, the racks can also be used as storage bins for a variety of small parts. Wm. Doepke Mfg. Co. Inc.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

Electric Hoist

. . . pushbutton controlled

A Lo-Hed electric hoist with welded steel chassis made in 2-ton and 3-ton capacities features heat-treated alloy steel, straight-line, three-reduction spur gears; automatic Weston heavy-duty lowering brake; heavy duty hoist and crane type motor.

Retaining the balanced design basic in all Lo-Heds, drum on one side, motor on the other, it also features single speed pushbutton

control, 110-v at the pushbutton without premium price; completely shrouded all-steel safety type bottom block. It has ball-bearing sheaves, hook carried on antifriction thrust bearing. American Engineering Co.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Rotary Tools

. . . complete range of sizes

Elgin enters the tungsten carbide field with a complete line of high precision rotary cutting and grinding tools for marketing to the metalworking industry through its abrasive division.

To be marketed under the Golden Circle trade mark, the tools will include a complete range of shapes, sizes and cutting actions for all types of material, finishes and processing methods. Burrs and files are available in seven shapes, in tungsten carbide or high-speed steel, hand-ground, machine-ground or file cut and in center-fluted or segment-fluted design. Elgin National Watch Co.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Acetylene Generator

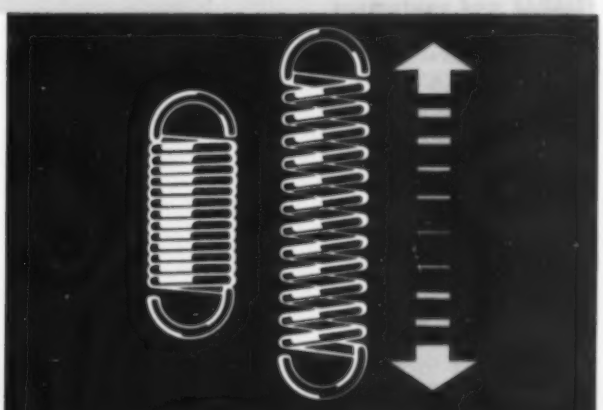
. . . acetylene flows continuously

Acetylene is delivered continuously, without interruption for water changes, residue removal or

carbide recharging by the Oxweld MP-11 acetylene generator. The MP-11 generates just enough gas to meet immediate demand from consuming equipment, even though this demand fluctuates over a wide range. It has a rated hourly output of 1000 cu ft with higher delivery rates available for shorter, intermittent periods.

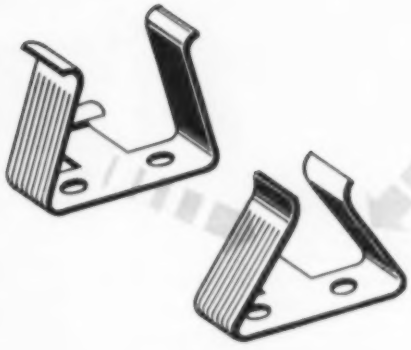
No standby generator is required for periods of carbide recharging,

COMPRESSION SPRINGS



EXTENSION SPRINGS

TORSION SPRINGS



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IN CANADA
The Wallace Barnes Co. Ltd.
Hamilton, Ontario

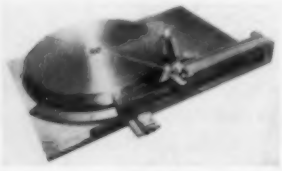
residue removal or water changing. Union Carbide & Carbon Corp.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Index Table

. . . mechanism outside table

An outside turning and locking index table, model No. 48, is announced by Air-Hydraulics Inc. The table is unique in that all working mechanism is outside the table itself. Adjustments can be made or working parts may be removed without disturbing the table or disassembling tooling.



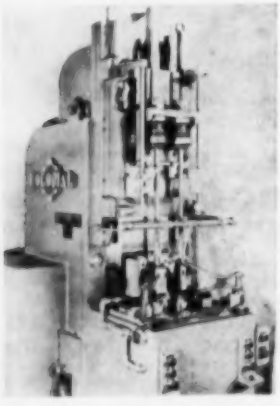
This model is available in sizes from 20 to 48 inches in diameter and with six or more stations. All sizes may be equipped for either air or hydraulic operation. When equipped for air, table operates on ordinary line pressures from 60 to 175 pounds. Air-Hydraulics Inc.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Broaching Machine

. . . combines two tools

Two pull-down broaching tools have been adapted to a single standard broaching machine, with



a single clamping and locating fixture for the purpose of broaching two parts at a time. The RD-6-42 machine with a 6-ton, 42-inch stroke capacity and the tools and fixture combination are products of Colonial Broach.

Loading portion of the fixture consists of two vertical locating pins over which opposite ends of the part are placed. Clamping is achieved mechanically as a cam on the main ram slide engages an arm on the fixture that is linked to the expanding jacks or wedges. Unclamping is achieved in the same manner after the broaches have completed their stroke. Wedging action of the fixture rigidly supports the two cantilevered arms, thereby resisting the high broaching loads as the tool passes through the holes. Colonial Broach Co.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Protective Device

. . . locks hydraulic setting

Cross Flow Control Lock is designed to prevent unauthorized personnel from tampering with the hydraulic feed setting on production

machine tools. It consists of a mounting plate, sidewalls and a hinged locking cover. After desired feed has been set, the cover is closed and locked with a key-operated, barrel-type lock.

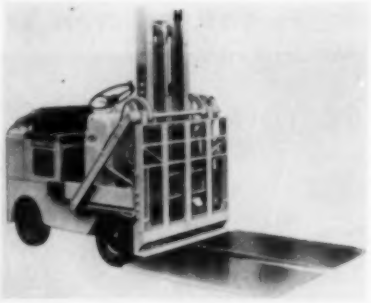
It is installed quickly and easily. Valve nameplate and adjusting lever are removed. Mounting plate is inserted under these parts, after which they are screwed back in place. Lock is compact, taking up same area as face of valve body. Cross Co.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Tow-Loader Device

. . . for mechanical handling

A new handling device designed by Towmotor makes it possible to use thin pallet sheets in place of the conventional fork-entry-type pallets used in handling unit loads. It consists of a modified Towmotor unloader accessory with a gripping device built into the pusher frame. The Tow-Loader pulls the palletized load onto either blades or forks and pushes it off at set-down points. With the device, the thickness of the ordinary pallet is saved and space is completely utilized. Since cost of the pallet sheets is small they are left with the unit loads so that, if desired, a Tow-Loader at the receiving end can unload the carrier in record



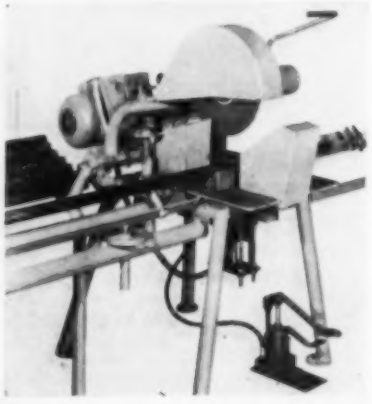
time. Once the unit loads have been placed on the pallet sheets, all further handling operations are mechanical. Towmotor Corp.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Cut-Off Saw

. . . permits burr-free cuts

A cut-off saw unit permits fast, square and practically burr-free cuts of tubular sections up to 4½ inches OD. It also cuts equivalent relieved shapes and solids up to 3 inches in diameter.



Abrasive wheel mounted on ball bearing spindle maintains alignment, cuts straight through work held on both sides of the wheel path for positive clamping, reduc-

ing the chief cause of wheel breakage. Wheel is quickly changeable in its swinging type guard. Wallace Supplies Mfg. Co.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

Tractor

. . . with 10 forward speeds

Caterpillar announces a 150-horsepower four-wheel tractor powered by a Cat six cylinder D326 diesel engine, producing 150 hp at 18000 rpm with 5¼-inch by 6-inch bore and stroke.

The engine features aluminum alloy pistons with cast in iron band backing for the top compression ring. Chrome-nickel steel heat plugs incorporated into the piston

are intended to give longer life. A triple duty oil pump provides positive lubrication on steep grades. Oil can be picked up from the front or rear of the oil pan or from the main oil sump located near the center of the tractor. Standard transmission gives 10 forward speeds up to 24 miles per hour and two reverse speeds up to 3.3 mph. Optional final drive gears make possible speeds up to 31.3 mph. Caterpillar Tractor Co.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Filter, Settling System

. . . removes small solids

Designed primarily for filtration of relatively small solids, this settling and filtering unit permits continuous removal of chips, heavy solids and relatively fine solids to 0.004-inch screening. It is made for filtration of liquids of varying degrees of viscosity, containing solids of different particle sizes and widely differing weights.

System makes use of the principle of expelling settled solids with

Precision-machined by Shenango for paper making machinery are these two centrifugally cast bronze wire stretch rolls with Meehanite Metal heads and steel journals. Note the special water slinger ring on the head.

Shenango methods ...Your gain!

SHOWN above are 15-foot wire stretch rolls of centrifugally cast bronze. From end to end, inside and out, these and all Shenango centrifugal castings are uniform in high quality.

The carefully controlled centrifugal casting process developed by Shenango assures exceptionally fine pressure-dense grain and freedom from costly imperfections. For you, these features mean trouble-free performance and wear resistance, minimum maintenance, and the ability to withstand abnormal loads and speeds. Yes, increased savings from every angle.

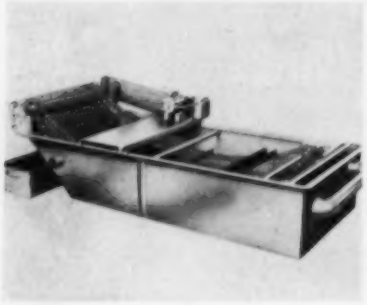
Shenango is prepared to supply either rough castings, semi-machined or precision-finished parts and assemblies in either ferrous or nonferrous metals. For further information and data on meeting specific needs, write to . . .

SHENANGO-PENN MOLD COMPANY
Centrifugal Castings Division
Dover, Ohio
Executive Offices: Pittsburgh, Pa.

SHENANGO

COPPER, TIN, LEAD, ZINC BRONZES • MONEL METAL
ALUMINUM AND MANGANESE BRONZES • NI-RESIST • MEEHANITE METAL

chain driven flights. Filter screens are continuously cleaned by brushes. Special bar type screens with accurate slot sizes provide for fil-



tering solids remaining in suspension as the liquid flows toward the outlet. They are furnished in slot sizes as small as 0.004-inches. Industrial Filtration Co.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Blast Cleaning Unit

. . . for continuous production

A blast cleaning unit designed to develop a high rate of continuous production has interchangeable work chucks available to handle production runs of different items. Additional chucks can be furnished to handle more than one piece of work at a time.

The blast cycle is controlled to conserve compressed air and to minimize wear within the unit. Blast nozzles are not active while rotary table is indexing. Timing of blast may be controlled to conform with the rotary table indexing rate. Macleod Co.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 133 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Shaft Inspection

Optical Gaging Products Inc.—"Shaft Inspection . . . by Optical Gaging" describes in detail a solution to the problem of shaft inspection. The "dual-image" ideal of two simultaneous images on a contour projector screen is defined. 4 pages cover how it works and what it means to the user.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Record-Playback Control

General Electric Co.—A system of recording motion on magnetic tape and playing it back for automatic programming of production machines and processes is described in a 6-page publication. Well-illustrated, it exlpains how record-playback control is especially valuable in bringing to small-lot manufacture many of the advantages of special, mass-production machines.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Safe Shipping

Signode Steel Strapping Co.—Their spring-summer issue of "Signode Seal" contains articles designed to provide customers and potential customers with useful information about safe shipping through better package protection and freight bracing. Unitizing, bundling many articles into one package for shippng, is described in a 2-page article.

FOR MORE DATA CIRCLE NO. 32 ON REPLY CARD

Electric Fork Trucks

Clark Equipment Co.—Industrial Truck Division offers "Electri-Facts," a 16-page, illustrated brochure presenting a thorough exploration of its electric fork truck line. The three separate brakes which are standard equipment are described and illustrated. Vital parts making up the integral drive unit are pictured with an explanation of the operation of the drive unit in response to the control circuit.

FOR MORE DATA CIRCLE NO. 33 ON REPLY CARD

Engineered Production

Sundstrand Machine Tool Co.—In a 32-page booklet, "Sundstrand Engineered Production Service for Small Lots, Long Runs and Special Turning Jobs," twenty examples of their engineered production are given. The detailed text is supplemented with numerous photographs and diagrams.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

Honing Machines

Sunnen Products Co. — A 10-page brochure covers typical applications from plants that have benefited from using Sunnen honing machines in production tool room, maintenance and salvage. Illustrated are several parts honed on their machines.

FOR MORE DATA CIRCLE NO. 35 ON REPLY CARD

Silicones

Dow Corning Corp.—Dow Corning offers a 24-page catalog designed to give some of the fabulous facts about silicones, the semi-inorganic materials developed and produced by them. What they are being used for now, and their potential use in the future is covered. "Tall Tales" of the past are related to "Fabulous Facts' 'of silicones.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

Steel Casting

Lebanon Steel Foundry—Lebanon announces publication of a 32-page brochure which treats the entire process of steel casting manufacture, from design and en-

where only the right steels work

J&L sheet and strip

Your particular requirements for formability, uniformity, and drawing qualities determine every step in the production of your order of J&L Sheet and Strip.

An understanding of product end use, and the physical and chemical properties required to do the job, are the foundation for J&L quality control practices. And J&L quality control assures accurate adherence to your specifications.

You can depend on J&L for Sheet and Strip Steel that helps you get the best out of high speed production equipment . . . adds to the value of your finished product.

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South Braintree 85, Massachusetts

gineering to final application. Written in nontechnical language, it is divided into a series of spreads which describe and illustrate everything that goes into steel casting manufacture at Lebanon.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARD

Punch Die Selection

F. J. Stokes Machine Co.—Helpful advice on the selection and ordering of punches and dies is offered in a booklet titled "Some Things You Should Know About Punches and Dies." Comments are offered on material selection for the proper degree of corrosion and abrasion resistance. Diagrams of seven shapes of tablets for which Stokes makes standard punches and dies and a list of 196 sizes regularly carried in stock are listed.

FOR MORE DATA CIRCLE NO. 38 ON REPLY CARD

Cold Resurfacing

Kaiser Aluminum & Chemical Sales Inc.—Chemical Division has prepared a booklet based on actual in-use experience of cold resurfacing open hearth furnace bottoms with Permanente 165 ramming material. The preparation and application are covered in 4 pages.

FOR MORE DATA CIRCLE NO. 39 ON REPLY CARD

Counterbores

Ex-Cell-O Corp.—A booklet describing and showing sizes of their holders, counterbores, countersinks and pilots, as well as complete counterbore sets, has been prepared by Continental Tool Works Division. All are stock items ready for prompt delivery.

FOR MORE DATA CIRCLE NO. 40 ON REPLY CARD

Decimal Equivalent Charts

Dayton Rogers Mfg. Co.—An 8x16-inch combination decimal equivalent chart and calender is available. The charts are printed in two colors, making a ready-reference chart for wall hanging.

FOR MORE DATA CIRCLE NO. 41 ON REPLY CARD

Coated Abrasives

Minnesota Mining & Mfg. Co.—Use of coated abrasives for grinding and finishing nonferrous metals is covered in an 8-page brochure. Pointed out is the fact that using coated abrasive belts and discs for removing nibs,

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risers, burrs or flashings from nonferrous castings results in better finishes, increased production and lower unit costs, with greater safety and less fatigue for the operator. Diagrams of machines are included.

FOR MORE DATA CIRCLE NO. 42 ON REPLY CARD

Kanigen Process

General American Transportation Corp.—GATX announces the publication of a 6-page booklet explaining the Kanigen chemical nickel plating process. How it saves, how it is available, its applications and chemical resistance are covered.

FOR MORE DATA CIRCLE NO. 43 ON REPLY CARD

Die Castings

Precision Castings Co. Inc.—A description of the company's integrated facilities and operations is incorporated in "Die Castings Unlimited," a 4-color, 24-page brochure. Over 75 pictures, drawings and charts graphically explain all the die-casting processes.

FOR MORE DATA CIRCLE NO. 44 ON REPLY CARD

Refractories Handbook

Walsh Refractories Corp. — A 123-page refractories handbook is offered by Walsh. It is designed to afford helpful information as a handy reference for users of refractories. Research and quality control, fire clay brick, standard and series shapes, high temperature refractory specialties, glass industry refractories, export, palletizing are the subjects covered. Each section is accompanied by many illustrations.

FOR MORE DATA CIRCLE NO. 45 ON REPLY CARD

Airblasting Nozzles

American Wheelabrator & Equipment Corp.—A catalog describing its line of airblast cleaning nozzles covers in detail three standard models of nozzles. Also included are pressure blast hose fittings for standard airblast nozzles. A description of the materials employed in the nozzles is given and a discussion of how to control compressed air consumption is covered.

FOR MORE DATA CIRCLE NO. 46 ON REPLY CARD

Shop Sanitation

F. E. Anderson Oil Co.—F. E. Anderson announces the availability of an 8-page pocket-size booklet printed to encourage shop sanitation through care of machine tool coolants. "We're Up To Our Necks in Good Shopkeeping" offers recommended procedure for cleaning machine tool coolant systems and outlines benefits derived.

FOR MORE DATA CIRCLE NO. 47 ON REPLY CARD

Plant Facilities

Treadwell Construction Co. — This catalog is designed to acquaint the reader with the various Treadwell facilites and products. Its various departments are briefly described and accompanied by several photographs to give comprehensive coverage.

FOR MORE DATA CIRCLE NO. 48 ON REPLY CARD

Insulating Castable Refractory

A. P. Green Fire Brick Co.—A 4-page brochure has been published to acquaint potential users with Kast-O-Lite, a lightweight insulating castable refractory for complete furnace linings. Advantages and technical data are included.

FOR MORE DATA CIRCLE NO. 49 ON REPLY CARD

Manual Handling

Kennett Equipment & Machinery Co.—A pocket-size catalog illustrating and describing its com-

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

ARTICLE OR ADVERTISEMENT — PAGE

TITLE

NAME

COMPANY

PRODUCTS MANUFACTURED

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5	15	25	35	45	55	65	75	85
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7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
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5-31-54

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plete line of special manual handling equipment is offered. Such products as pin trucks, dye house trucks, conditioning trucks and dolly trucks are described. One section is devoted to details of the company's new type caster for use where continuous wet conditions are encountered.

FOR MORE DATA CIRCLE NO. 50 ON REPLY CARD

Power Driven Brushes

C. W. Morris Co.—A catalog of power driven brushes gives 16 pages of facts, application and product data for such work as deburring, roughing, stripping, polishing, etc. Illustrated are models up to 15 inches in diameter, miniature sections down to 1⅜ inches, end brushes including knot type, solid filled and circular, and many other types.

FOR MORE DATA CIRCLE NO. 51 ON REPLY CARD

Boiler Water Level Controls

McDonnell & Miller Inc.—A 24-page catalog just published covers their standard products and many of the special adaptations and components that have been developed over the years. It contains fairly complete engineering information, including capacity curves and roughing-in dimensions.

FOR MORE DATA CIRCLE NO. 52 ON REPLY CARD

Cutting Tools

Wendt-Sonis Co.—A comprehensive catalog of some 80 pages is offered covering their line of carbide-tipped cutting tools. Each tool is accompanied by charts giving diameter and photographs. A section is devoted to selection tables for determining correct Carboloy grades and machining speeds.

FOR MORE DATA CIRCLE NO. 53 ON REPLY CARD

Cutting, Grinding Fluids

D. A. Stuart Oil Co. Ltd.—A 16-page booklet on proper selection and application of four different water-mix cutting and grinding fluids is offered. The booklet discusses various types of water-mixtures and factors in proper selection and application.

FOR MORE DATA CIRCLE NO. 54 ON REPLY CARD

Selenium Rectifiers

Fansteel Metallurgical Corp. — "Fansteel Selenium Rectifiers — Engineering Information Bulletin 6.400" contains information useful to the design engineer who uses rectifiers. Covered are: Standard cell sizes and ratings; typical rectifier circuits, formulae and constants; elementary operating principles, etc. Typical applications with circuit diagrams are given.

FOR MORE DATA CIRCLE NO. 55 ON REPLY CARD

EDITORIAL REPRINTS:

St. Lawrence Seaway

Second in a series of three articles on the St. Lawrence River Seaway, appearing on p. 58, outlines the physical aspects of the gigantic proposal, including building of power dams, deepening of the river channel and the planning attending exploitation of the project's full potential for trade and industry in the Great Lakes region. The first article, May 24, was a summation of the over-all proposition.

FOR MORE DATA CIRCLE NO. 56 ON REPLY CARD

Selling Abroad: It's Up to You

If the Randall Commission recommendations for lower U. S. economic aid to our allies are followed, a marked drop in exports could result. So, from now on it's up to you to take over from the government to push non-military trade. To do this, see p. 50 for tips on how to select the right product to sell abroad and where and how to sell it.

FOR MORE DATA CIRCLE NO. 57 ON REPLY CARD

Welding, Soldering Stainless

Article on page 108 describes how you can weld or solder stainless with the same equipment you use for carbon steel. Special characteristics are given along with Armco's tips on what to do about them.

FOR MORE DATA CIRCLE NO. 58 ON REPLY CARD

Circulating Spraying

Starting at an isolated mixing room, paint or other finish is circulated to all spray stations, then back to tanks. Color and viscosity are precisely controlled. On page 94 you'll find a description of the system and why it offers a more uniform finish.

FOR MORE DATA CIRCLE NO. 59 ON REPLY CARD

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5-31-54

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PRODUCTS MANUFACTURED _____

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STEEL

May 31, 1954

Market Outlook

JUNE will be a little busier steel month than May, if current sentiment continues. And May had the best daily rate of steel ingot production since February.

When all of the May figures are in, it will be found that ingot production that month averaged approximately 70.5 per cent of capacity. The February average was 74.3 per cent; the March average, 69 per cent; and the April average, 68.2 per cent.

STRONGER— As May neared an end, steel ingot production continued increasing slightly and nudged STEEL's production rate up to 70.5 per cent of capacity in the week ended May 30. That was a rise of half a point over the preceding week, which had been the highest since the close of February.

SINEWS— June could well be a pretty good month. Summer vacations and hot weather don't start slowing things down that early. Good weather promotes the use of steel among such heavyweight customers as the construction industry. Threat of a steelworkers' strike could inspire a buying spree. Demands growing out of the increasingly taut international situation could begin appearing.

IN DEFENSE—Some new defense business is already coming out. The Midvale Co., Philadelphia, received a $3,321,000 Army contract for mass production of high-explosive shells for atomic cannon. These shells will require forgings in excess of 11 inches in diameter. Contracts such as this may impart some strength to the steel bar market. The hot carbon bar market has been sluggish for some time. Now, however, the decline in defense requirements for bars appears to have leveled off, with some indications of an increase over coming weeks.

The improved demand for bars is not limited to the hot-rolled carbon product. The improvement embraces alloy as well as carbon, and cold-finished as well as hot-rolled. No one consuming field is responsible; the better tone is general.

Navy orders for hull plates will be higher in June, too.

GOOD SOURCE—New construction projects are coming out sufficiently fast to assure good demand for reinforcing steel and structurals, although bidding by fabricators is keen.

In some cases, producers of seamless tubing are booked solidly through June.

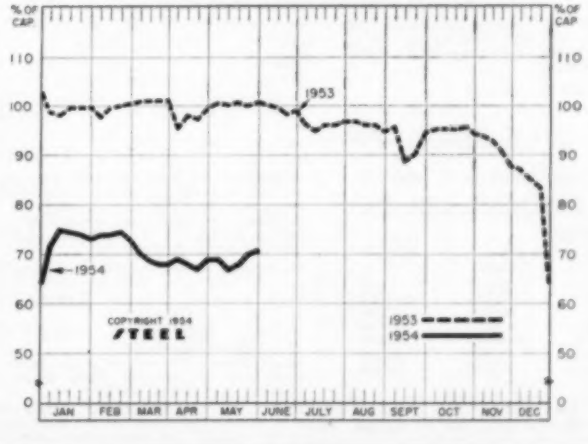
Among the light, flat-rolled products, galvanized steel sheets are in strongest demand. However, in some instances hot-rolled and cold-rolled carbon sheets are showing improvement.

OPTIMISTIC—In the Midwest, foundries are taking a little more pig iron than they took in April. In general, foundry operators there are optimistic about the future.

Steel warehouses, suppliers to small consumers, say business is fair and moderately steady, and most warehouses expect this level to hold through June.

PRICE PICTURE—Steel prices remain steady and hold STEEL's finished steel price composite at $113.70 a net ton. Steel scrap prices which had been rising, turned downward and cut STEEL's price composite on steelmaking scrap to $28.17 per gross ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended May 30	Change	Same Week 1953	Same Week 1952
Pittsburgh	68	— 1.5*	95.5	103
Chicago	82.5	— 1*	105	106
Mid-Atlantic	58	+ 1	97.5	98
Youngstown	68	0	105	105
Wheeling	83.5	+ 1	102	95.5
Cleveland	71	+ 0.5*	105.5	105.5
Buffalo	67.5	0	106.5	104
Birmingham	76.5	+ 0.5	103	102
New England	59	— 7	85	75
Cincinnati	68.5	+ 9	100	94.5
St. Louis	64.5	— 8	89.5	96.6
Detroit	69	+ 3.5	109.5	110
Western	75	+ 0.5	111	102.5
National Rate	70.5	+ 0.5	100.5	102.5

INGOT PRODUCTION‡

	Week Ended May 30	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	104.6	106.6	101.9	140.8
NET TONS (In thousands)	1,660	1,713	1,637	2,262

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,450 in 1953; 2,077,040 in 1952.

The Metalworking Outlook—p. 39 Technical Outlook—p. 89

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended May 25

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.575	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.963	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.900	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.600	Bars, C.F., carbon	7.974	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.350	Bars, C.F., alloy	10.975	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.367	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.755	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.503	Sheets, C.R., carbon	5.696	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.80 (lb)	1.075	Sheets, galvanized	6.895	Tubing, mechanical, stainless, 304 (100 ft)	161.193	‡ Not available.	
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.229				

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	May 25 1954	May 18 1954	Month Ago	Apr. Average
(1947-1949=100)	140.8	140.8	140.8	140.9

STEEL's FINISHED STEEL PRICE INDEX*

	May 26 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1953-39 av.=100)	189.75	189.74	189.74	182.82	154.01
Index in cents per lb	5.140	5.140	5.140	4.963	4.172

STEEL's ARITHMETICAL PRICE COMPOSITES

	May 26 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT*	$113.70	$113.70	$113.70	$111.28	$92.77
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	55.04	46.67
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	45.60
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.27
Steelmaking Scrap, GT	28.17	28.33	26.00	39.17	22.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	May 26 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.35
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	4.405	4.405	4.405	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.40
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.10	4.35	3.50
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.10	4.35	3.65
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.25
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.975-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.65	5.65	5.65	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.225-5.475	4.15
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75

SEMIFINISHED STEEL					
Billets, forging, Pitts (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	May 26 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.25	49.39
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, del. Phila.	60.16	60.16	60.16	59.75	49.89
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	39.38
No. 2 Fdry(Birm.) del. Cin.	60.43	60.43	60.43	58.93	45.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$30.50	$29.50	$26.50	$39.50	$23.00
No. 1 Heavy Melt, E. Pa.	23.00	23.00	22.00	41.50	21.50
No. 1 Heavy Melt, Chicago	31.00	31.50	29.50	36.50	21.50
No. 2 Heavy Melt, Valley	29.50	29.50	28.50	41.50	22.00
No. 1 Heavy Melt, Cleve.	28.50	28.50	25.50	39.00	18.50
No. 1 Heavy Melt, Buffalo	25.50	25.50	25.50	40.75	22.25
Rails, Rerolling, Chicago	42.00	42.00	39.50	47.50	27.75
No. 1 Cast, Chicago	38.50	38.50	38.50	39.00	27.50

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.25
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	16.75
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 13, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 27.00-27.50 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa, or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 del. Conn. Valley, 30.125 del. Midwest; Lake 30.00 del.; Fire refined 29.75 del.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 13.80, chemical 13.90, corroding 13.90, St. Louis; New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, selfpalletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $260-$270 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or

DAILY NONFERROUS PRICE RECORD

	Price May 26	Last Change	Previous Price	Apr. Avg.	Mar. Avg.	May 1953 Avg.
Copper	30.00	Apr. 12	29.75-30.00	29.955	29.865	29.845
Lead	13.80	Apr. 12	13.55	13.710	12.735	12.550
Tin	94.00	May 26	93.75	96.260	92.518	97.240
Tin	93.75	May 19	93.50	96.260	92.518	97.240
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	21.50	July 15, 1953	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.8%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, del.; Magnesium 99.8%, Freeport, Tex.

ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $70-$75 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, spot, 94.00; prompt, 94.00.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.) $4.72; grade A-2 (0.5% Fe max.) $4.46 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.65 per lb f.o.b. shipping point; less than 1000 lb $4.80; 99+% hydrogen reduced, $4.95. Treated ingots $6.70.

Zinc: Prime Western 10.50, brass special 10.75, intermediate 11.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.85, special high grade 12.00, die casting alloy ingot 14.50, del.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloy 19.20-20.50; No. 12 foundry alloy (No. 2 grade) 19.25-19.75; 5% silicon alloy, 0.60 Cu max., 20.00-23.00; 13 alloy, 0.60 Cu max., 22.25-23.25; 195 alloy 21.00-21.50; 108 alloy 19.50-20.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.00-20.50; grade 2, 18.50-19.00; grade 3, 17.75-18.25; grade 4, 16.50-17.50.

Brass Ingot: Red brass, No. 115, 27.00; tin bronze No. 225, 39.00; No. 245, 33.25; high-leaded tin bronze, No. 305, 31.50; No. 1 yellow, No. 405, 23.25; manganese bronze No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c. 37.03. Magnet wire del., 15,000 lb or more 41.83; l.c.l. 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $19.00 per cwt; pipe, full coils $19.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

	NICKEL, "A" Nickel	MONEL, Monel	INCONEL, Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb) Sheets and Circles: 28 and 38 mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
5OS-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
⅜	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 83.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stocks: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ⅛-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	33.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.25	45.95	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	79.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 28 clippings 13.00-13.50; low copper clippings 13.00-13.50; mixed clippings 11.00-11.50; old sheet 10.50-11.00; borings and turnings 6.50-7.00; pistons and struts 7.00-7.50; crankcases 10.50-11.00; industrial castings 10.50-11.00.

Copper and Brass: Heavy copper and wire, No. 1 24.50-25.00; No. 2 copper 23.00-23.50; light copper 21.00-21.50; No. 1 composition red brass 18.50-19.00; No. 1 composition turnings 17.75-18.25; mixed brass turnings 13.00; new brass clippings 18.00; No. 1 brass rod turnings 13.75-14.25; light brass 12.00; heavy yellow brass 13.75-14.25; new brass rod ends 15.25; auto radiators, unsweated 15.00; cocks and faucets 16.00-16.50; brass pipe 17.00.

Lead: Heavy 10.75-11.25; battery plate 5.75-6.25; linotype and stereotype 13.00; electrotype 11.25; mixed babbitt 12.75.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 45.00-50.00.

Zinc: Old zinc, 4.50; new die cast scrap, 4.00; old die cast scrap, 3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 28, 38 clippings 14.50-15.00; 518, 528 clippings 14.50-15.00; 148, 178, 248 clippings 13.00-13.50; mixed clippings 12.50-13.50; old sheet 11.50-12.50; old cast 11.50-12.50; clean old cable, free of steel 14.50-15.00; borings and turnings 12.00-13.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 27.00-27.25; No. 2 copper 25.50-25.75; light copper 24.00-24.25; refinery brass (60% copper) per dry copper content 22.50; auto radiators, 17.00-17.25.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 27.00; No. 2 copper 25.50; light copper 24.00; No. 1 composition borings 20.50; No. 1 composition solids 21.50; heavy yellow brass solids 16.25-16.50; yellow brass turnings 15.00-15.25; radiators 17.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.125; 200-499 lb $1.11; 500-999 lb $1.105; 1000 lb or more $1.10.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 71.5; 100-600 lb 57.2; 700-1900 lb 54.7; 2000-9900 lb 53; 10,000 lb or more 51.9.

Stannous Chloride (Anhydrous): Less than 50 lb $1.576; 50 lb $1.236; 100-300 lb $1.086; 400-900 lb $1.061; 1000-1900 lb $1.037; 200-4900 lb $1; 5000-19,000 lb 93.9; 20,000 lb and over 87.8.

Stannous Sulphate: Less than 50 lb $1.275; 50 lb 97.5; 100-1900 lb 95.5; 2000 lb and over 93.5.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Next 60 days in the metal market look pretty good, and chances of a summer slump are slight. Most industry men are optimistic about an upturn, especially in aluminum

IF YOU'RE STILL WAITING for the metals to nosedive, don't hold your breath.

No pronounced sag is expected in the next 60 days. Most market authorities consider the chances for a midsummer dip equally slim.

Solid Base—The strong market undertone is both horizontal and vertical. It's found in most nonferrous metals, and if there's any consensus among producers, processing mills, distributors and fabricators, it's in support of a definite but spotty trend upward.

International tensions may be changing people's minds about keeping inventories low and waiting for price breaks. Probability of a pickup in production of defense items can contribute. The normal summer lull is explained away by cheerful forecasters as never being as serious as anticipated and generally overcompensated for in advance.

Lift for Light Metals—Aluminum has taken the least market buffeting of the major metals and is snapping back first. Magnesium, though harder hit, is also staging a comeback.

Aluminum men see clear skies in the immediate future as well as on the much-publicized horizon. Items of note—mill and warehouse orders call for heavier tonnages; price concessions are granted less frequently; fabricated product shipments are better balanced.

Watch Copper Stocks—When May copper statistics are tabulated, they'll show a sharp drop in stocks held by U. S. producers. They stood at 125,000 tons entering May. A dip below the 100,000-ton mark at month end won't be surprising. Accounting chiefly for the expected dip is completion of the purchase by General Services Administration of Chilean copper—64,000 tons from Anaconda Sales Co. and 36,000 tons from Kennecott Sales Corp. Much of this metal is already in the U. S., and deliveries to stockpile are now under way. Price is 30 cents per pound, less allowances for cathode and fire-refined copper.

Equally important from an industry viewpoint is the increase in fabricator orders. Copper is winding up its fourth consecutive month of demand improvement. May orders are expected to top April by 10 per cent—and April's consumption of 105,000 tons was highest since last October. Brass and wire mills have lowest order backlog in years, but incoming orders are strongest in eleven months and processing inventories are low.

Government Buying Near?—General improvement is reported in lead and zinc, though the industry has an ear permanently cocked toward Washington for word of stockpiling and tariff recommendations. A mid-June date for lead-zinc purchases to begin has passed around; a recommendation by the Tariff Commission of higher import duties on the two metals is considered almost automatic. Whether it becomes effective depends on how the President reconciles his free trade views with economic and political pressures.

The lead market today is stable without government help, though imports are again rising after a dramatic drop early this year. Batterymakers and cable companies are placing good-sized orders and at flat prices, even for June delivery. Price is sure to move up a couple of notches if stockpiling begins next month.

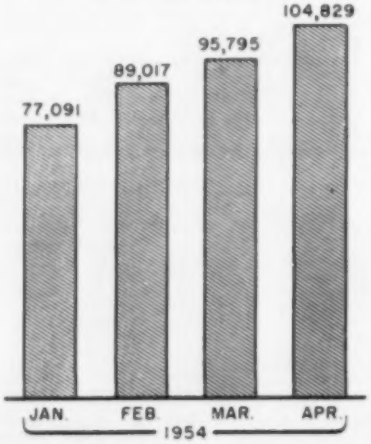
Zinc in the Pink—As a precaution against higher prices that could be caused by stockpiling, zinc users are buying further ahead. Futures trading is especially active at levels suggesting such an upturn is more than a mere possibility. Galvanizers' orders have shown marked improvement in the last three weeks. Die casters, beginning work on new model autos, are more active buyers. The combination of events was enough to push zinc's price up a quarter-cent at midweek.

Tin price has been remarkably passive in recent weeks, despite the jumpy international situation to which it responds. Price rut runs between 93 and 94 cents. Users buy sparingly and stick to spot metal.

DISPLAY OF STRENGTH

Copper Deliveries to Fabricators

(tons of 2000 pounds)



Source: Copper Institute

Nicaro's Future Brightens

The government-owned, privately operated nickel plant in Nicaro, Cuba, will be "converted by lease or sale into a permanent commercial venture as soon as it is on solid financial footing," says GSA Administrator Edmund F. Mansure. The plant last week paid the treasury $1.1 million used in buying the mines early in World War II. Total government investment in the plant is about $50 million.

Airplanes Gobble Up Aluminum

The aircraft industry takes 1 out of every 6 pounds of aluminum produced in the U. S., says Mundy I. Peale, president, Republic Aviation Corp. In the last two years 350,000 tons of aluminum, 16 per cent of U. S. production, were used in building 29,000 airplanes. In covering airframes of the single-engine Thunderjet and Thunderstreak fighter-bombers, Republic last year used over 5500 tons of aluminum sheet.

New Furnace Improves Titanium

A 20-ton, automatic, double-melting vacuum-type titanium remelting furnace put into operation by Titanium Metals Corp. of America is improving metal quality and pointing the way to significant cost reductions, the company says. Process substitutes vacuum procedure for inert gas atmosphere in the furnace, allowing removal of hydrogen down to as low as 0.005 per cent. Further-improved units are currently under construction and double-melting furnaces for 8000-pound ingots are receiving serious consideration. Present unit remelts into 24-inch, 4000-pound ingots.

LONG-TIME PLANNING at *Newport Steel*

It takes long experience, engineering skill and careful planning to operate modern steel facilities such as this reversing hot mill that converts ingot into coil in six minutes. Other long-time planning includes Newport's irrevocable policy of considering regular customers an integral part of this business, with first claim upon its capacity in good times and bad. Newport makes steel to your exact specifications and ships it by rail, water or truck from the heart of the fastest growing industrial area in America. Let's discuss your requirements and our facilities, and match them for our mutual benefit.

PRODUCTS OF NEWPORT STEEL

- Hot-Rolled Steel in Coil
- Hot-Rolled Pickled Steel in Coil
- Electric Weld Line Pipe
- Hot-Rolled Sheets
- Galvanized Sheets
- Galvannealed Sheets
- Colorbond Sheets
- Hot-Rolled Pickled Sheets
- Electrical Sheets
- Alloy Sheets and Plates
- Roofing and Siding
- Eave Trough and Conductor Pipe
- Culverts

ECONOMICAL WATERAIL DELIVERY

Newport Steel is situated on the Mississippi-Ohio River system and the great Cincinnati rail hub. With the advantage of location, new river barge facilities and seven major railroads, Newport gives economical, dependable delivery to industrial areas throughout the Middle West and South

Newport Steel

CORPORATION

NEWPORT, KENTUCKY

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 141. Key to footnotes, page 143.

SEMIFINISHED

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana,Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS Carbon Rerolling (NT)
Aliquippa,Pa. J5 ....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 .....62.00
Lackawanna,N.Y. B2 ..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3 ..80.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 .....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 .....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 .....75.50
Lackawanna,N.Y. B2 ..75.50
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....75.50
Seattle B3 .....89.00
So.Chicago R2,U5,W14 ..75.50
So.Duquesne,Pa. U5 ...75.50
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 ....82.00
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ....82.00
Johnstown,Pa. B2 .....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5,W14 .82.00
So.Duquesne,Pa. U5 ..82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ....113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ...$93.18

SKELP
Aliquippa,Pa.J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity,Ala. R2 ...4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 .....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
Kokomo,Ind. C16 ....4.625
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ...4.775
Monessen, Pa. P7 ....4.525
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ..5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 ....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2 ..4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

STRUCTURALS

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ...4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 .....4.10
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 .....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ....4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5,W14 .4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 .....4.10

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 .....5.10
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 ....4.15
So.Chicago,Ill. U5 ....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 ....5.00

H.S., L. A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 ....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ....6.175
Ind.Harbor,Ind. Y1 ....6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ....6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5,W14 .6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L. A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ....6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 ....6.125

PILING

Bearing Piles
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 ....4.10

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...4.925
Lackawanna,N.Y. B2 ..4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 ....4.925

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ...4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky.(15) A10 ...4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 .....4.10
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 .....4.10
Conshohocken,Pa. A3 ...4.10
Ecorse,Mich. G5 .....4.25
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 .4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 .....4.30
Harrisburg,Pa. C5 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1.4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ..4.10
LoneStar,Tex. L6 .....4.40
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14.4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1.4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.40
Fairfield,Ala. T2 .....6.25
Fontana,Calif.(30) K1 ..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ....6.25
Ind.Harbor,Ind. Y1 .....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ....6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14.6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 ....5.55
Coatesville,Pa. L7 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago,Ill. U5, W14.5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ...5.15
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill. U5 .....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland l.c.l.(15) A10..4.85
Cleveland c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

BARS

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.35
Bessemer,Ala. T2 .....4.15
Birmingham,Ala. C15. ..4.15
Buffalo(31) R2 .....4.18
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.30
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ....4.18
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity, Mo. S5 ....4.75
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11.4.15
Pittsburg,Calif. C11 ...4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14, P23....4.90
So.Chicago U5, W14 ....4.15
Chicago(31) R2 .....4.22
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3 ..4.90
Sterling,Ill. (1) N15 ...4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 ....4.20

Bars, Hot-Rolled Alloy
BethlehemPa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 ....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 .....5.025
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 ....5.925
Gary, Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2,Y1.4.875
Johnstown,Pa. B2 .....4.875
KansasCity,Mo. S5 ....5.475
Lackawanna,N.Y. B2 ..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2,U5,W14.4.875
So.Duquesne,Pa. U5 ...4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.225
Bessemer,Ala. T2 ....6.225
Bethlehem,Pa. B2 .....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.375
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb.,Ind. I-2 ....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2 ..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ...6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES,H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES: S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.35
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.20
BeaverFalls,Pa. M12....5.20
BeaverFalls,Pa. R2 ....5.26
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 ....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ..5.20
Gary,Ind. R2 .....5.27
GreenBay, Wis. F7 ....5.20
Hammond,Ind. L2, M13.5.20
Hartford,Conn. R2 .....5.70
Harvey,Ill. B5 .....5.20
LosAngeles R2 .....6.65-6.96
LosAngeles S3o 6.65
Mansfield,Mass. B5 ....5.75
Massillon,O. R8 .....5.20
Massillon,O. R2 .....5.24
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.65
NewCastle,Pa.(17) B4 ..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 ....5.45
Putnam,Conn. W18 ....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ...6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Alloy (Turned and Ground)
Cumberland,Md.(5) C19.4.45

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 ....6.325
Carnegie, Pa. C12 ....6.325
Chicago W18 .....6.325
Cleveland A7, C20 ....6.325
Detroit R7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.525
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2,M13.6.325
Hartford,Conn. R2 ....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2 ..6.325
Mansfield,Mass. B5 ..6.775
Massillon,O. R2, R8 ..6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth,Mich. P5 ....6.525
So.Chicago,Ill. R2,W14.6.325
SpringCity,Pa. K3 .....6.50
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ..6.625
Youngstown F3, Y1 ..6.325

BARS, Reinforcing (fabricators)
AlabamaCity,Ala. R2 ...4.15
Atlanta A11 .....4.35
Birmingham,Ala. C15 ..4.15
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 ....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
Sand&Springs,Okla. S5 ..5.00
Seattle B3, N14, P23....4.90
So.Chicago,Ill. R2 .....4.15
So. Duquesne,Pa. U5 ..4.15
So.SanFrancisco B3 ....4.90
SparrowsPoint,Md. B2 ..4.15
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Youngstown R2,U5 ....4.15

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼-1" B2 ...5.55
KansasCity S5 .....6.35
LosAngeles B3 .....5.80
Marion,O. P11 .....5.55
Seattle N14 .....5.80
Seattle B3, P23 .....5.85
So.SanFrancisco B3 ....5.85
SparrowsPt. ½-1" B2 ..5.55
Williamsport,Pa. S19 ...5.45

RAIL STEEL BARS
Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.05
ChicagoHts.(4) C2, I-2..4.15
Ft.Worth,Tex.(26) T4 ..4.65
Franklin,Pa.(3) F5 ....4.05
Franklin,Pa.(4) F5 ....4.15
Marion,O.(3) P11 .....4.00
Moline,Ill.(3) R2 .....4.15
Tonawanda(3,4) B12 ...4.15
Williamsport,Pa.(3) S19.4.25
Williamsport,Pa.(4) S19.5.45

BARS, Wrought Iron
Economy,Pa.(S.R.)B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(S.R.) L5 ...10.40
McK.Rks.(D.R.) L5 ...14.00
McK.Rks.(Staybolt) L5.15.50

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ...3.925
Allenport,Pa. P7 .....3.925
Ashland,Ky.(8) A10 ...3.925
Cleveland J5, R2 ....3.925
Conshohocken,Pa. A3 ..3.975
Detroit M1 .....4.075
Ecorse,Mich. G5 .....4.075
Fairfield,Ala. T2 .....3.925
FairlessPa. U5 .....3.975
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Geneva,Utah C11 .....4.025
GraniteCity,Ill. G4 ....4.125
Ind.Harbor,Ind. I-2, Y1.3.925
Irvin,Pa. U5 .....3.925

Kokomo,Ind. C16 ....4.025
Lackawanna,N.Y. B2 ..3.925
Munhall,Pa. U5 .....3.925
Newport,Ky. N9 .....3.925
Niles,O. N12 .....5.175
Pittsburg,Calif. C11 ...4.625
Pittsburgh J5 .....3.925
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md. B2.3.925
Steubenville,O. W10 ..3.925
Torrance,Calif. C11 ..4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown U5, Y1 ...3.925

SHEETS H.R. (19 gage)
AlabamaCity,Ala. R2 .5.225
Dover,O. R1 .....5.05
Kokomo,Ind. C16 ....5.025
Mansfield,O. E6 .....5.05
Niles,O. N12 .....4.775
Torrance,Calif. C11 ....5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.05
Fairfield,Ala. T2 .....5.90
Fairless,Pa. U5 .....5.95
Fontana,Calif. K1 ....6.675
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ....5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 ....5.90
SparrowsPoint (36) B2..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)
Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....6.525
Ind.Harbor,Ind. I-2 ..4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)
Allenport,Pa. P7 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.925
Fairfield,Ala. T2 .....4.775
Fairless,Pa. U5 .....4.825
Follansbee,W.Va. F4 ..4.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind. I-2, Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ...5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 ....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.375
Fairless,Pa. U5 .....7.275
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1..7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2.7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Culvert	**Cu Alloy**	**Cu Fe**
Ashland,Ky. A10	6.325	....
Canton,O. R2	6.075	6.675
Fairfield T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind.Harbor I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.175	....
MartinsFry.,O. W10	6.075	....
Pitts.,Calif. C11	6.825	....
SparrowsPt. B2	6.075	....
Torrance,Cal. C11	7.075	....

SHEETS, Culvert Pure Iron
Ashland,Ky. A10 ....6.575
Fairfield,Ala. T2 .....6.325
MartinsFerry,O. W10..6.325

SHEETS, Gal'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.275
Ashland,Ky.(8) A10 ..5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 .....5.275
Gary,Ind. U5 .....5.275
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.275
Irvin,Pa. U5 .....5.275
Kokomo,Ind. C18 .....5.375
MartinsFerry,O. W10...5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ...6.025
SparrowsPoint,Md. B2.5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ...6.275
Weirton,W.Va. W6 ....5.275

SHEETS, Galvanized No. 10 High-Strength Low-Alloy
Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky. (8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825
Kokomo,Ind. C16 ....5.925
Niles,O. N12 .....5.825

SHEETS, ZINCGRIP Steel
Butler,Pa. A10 .....5.275
Middletown,O. A10 ....5.275

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.575
Middletown,O. A10 ....5.575

SHEETS, Electrogalvanized
Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.375
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ..7.20
Follansbee(23) F4 .....6.425
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)
BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....6.075

SHEETS, Well Casing
Fontana,Calif. K1 ....6.20

STRIP

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ..3.925
Atlanta A11 .....4.125
Bessemer,Ala. T2 ....3.925
Birmingham C15 .....3.925
Bridgeport,Conn.(10)S15 3.95
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.06
Detroit M1 .....4.075
Ecorse,Mich. G5 .....4.075
Fairfield,Ala. T2 ....3.925
Fontana,Calif. K1 ....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5 .4.525
Lackw'na,N.Y.(35) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y. B11 3.925
Pittsburg,Calif. C11 ..4.675
Portsmouth,O. P13 ....3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3, P23 ..4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ..3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2..3.925
Torrance,Calif. C11 ....4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 ....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 ....7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.10
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ...6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3, P23 ..6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3 6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon
Anderson,Ind. G5 .....5.45
Baltimore T6 .....5.60
Bridgeport,Conn.(10)S15 5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.60
Detroit M1 .....5.60
Detroit D2, P20 .....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.60
Follansbee,W.Va. F4 ..5.45
Fontana,Calif. K1 ....7.35
FranklinPark,Ill. T6 ...5.70
Ind.Harbor,Ind. I-2 ....5.70
Indianapolis C8 .....5.60
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.10
Middletown,O. A10 ....5.45
NewBedford,Mass. R10..6.00
NewBritain(10) S15 ...5.45
NewCastle,Pa. B4, E5,.5.45
NewHaven,Conn. A7 ...6.20
NewHaven,Conn. D2 ...5.90
Pawtucket,R.I. N8, R3..6.10
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(32) R6 ....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....5.90
Warren,O.(40) T5 ....5.45
Warren,O. B9, R2 ....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. A7 ....6.30
Youngstown C8, Y1 ....5.45

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 .....12.00
Pawtucket,R.I.(11) N8.12.15
Pawtucket,R.I.(12) N8.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ....12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.30
Lackawanna,N.Y. B2 ...8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....6.05

STRIP, Electrogalvanized
Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....6.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke,Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co. Inc.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg.Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Spring Steel (Annealed)					
Baltimore T6	5.60	7.95	8.90	10.85	13.15
Bridgeport,Conn.(10) S15	5.45	7.85	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	7.85	8.60	10.56	12.85
Cleveland A7	5.45	7.85	8.60	10.55	12.85
Cleveland,O. C7	...	8.00	8.60	10.56	12.85
Dearborn,Mich. D3	5.60	7.85	8.80	....	....
Detroit D2	5.55	7.85	8.80	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N. J. C18	...	...	8.90	10.85	13.15
Indianapolis C8	...	7.80	8.60	10.56	....
Mattapan,Mass. T6	6.10	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.90	10.85	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I.(11) N8	...	7.65	8.60	10.56	12.85
Pawtucket,R.I.(12) N8	6.10	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.10	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.56	12.85
Spring Steel (Tempered)					
Buffalo W12	...	...	12.50	....	....
Bristol,Conn. W1	...	...	12.50	15.00	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Worcester,Mass. W12	...	...	12.50	....	....
Youngstown C8	...	...	12.85	15.35	18.35

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Armature	Electric Motor		Dynamo
BeechBottom,W.Va. W10	...	...	8.75	9.75	10.65
Brackenridge,Pa. A4	...	...	8.75	9.75	10.65
IndianaHarbor,Ind. I-2	7.85	8.15	8.75	9.75	....
Mansfield,O. E6	7.85	8.15	8.75	9.75	10.65
Newport,Ky. N9	7.85	8.15	8.75	9.75	10.65
Niles,O. N12	7.85	8.15	8.75	9.75	....
Vandergrift,Pa. U5	...	8.15	8.75	9.75	10.65
Warren,O. R2	7.85	8.15	8.75	9.75	....
Zanesville,O. A10	...	8.15	8.75	9.75	10.65

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric Motor		Dynamo
GraniteCity,Ill. G4	8.25*	8.60*	9.20*	10.20*	....
IndianaHarbor,Ind. I-2	8.05	8.40*	9.00*	....	....
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05†	8.90	9.50	10.50	11.40

H.R. SHEETS (22 Gage) (Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge,Pa. A4	11.60	....	....	....
Newport,Ky. N9	11.60	....	....	....
Vandergrift,Pa. U5	11.60	12.15	12.65	13.65
Zanesville,O. A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENGTHS (22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10	....	....	16.25	16.75	....
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75	12.35‡
Warren,O. R2	....	....	....	....	12.35‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.85	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 Lb Coke (Base Box)	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.40	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.725
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (34) S1	5.75
Houston S3	5.925
Jacksonville,Fla. M8	6.06
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill.(1) N15	5.536
Struthers,O. Y1	5.525
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Millbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7, P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving(8"Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7,T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Portsmouth,O. D2	9.50
Roebling,N.J. R5	9.50
SparrowsPt.,Md. B2	9.60

ROPE WIRE (A)	
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Baltimore T6	7.75
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P7, P16	7.45
Pawtkt.,R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City R2	6.675	7.075**
Aliquippa J5	6.675	7.20*
Atlanta A11	6.775	7.30
Bartonville(48)K4	6.775	7.30
Buffalo W12	6.675	7.075†
Cleveland A7	6.675	....
Crawfordsville M8	6.775	7.30
Donora,Pa. A7	6.675	7.075†
Duluth,Minn. A7	6.675	7.075†
Fairfield T2	6.675	7.075†
Houston,Tex. S5	7.075	7.475
Jacksonville,Fla. M8	7.20	7.73
JohnstownB2(48)	6.675	7.225*
Joliet,Ill. A7	6.675	7.075†
KansasCity,Mo. S5	7.275	7.675
Kokomo C16	6.775	7.175†
LosAngeles B3	7.625	....
Minnequa C10	6.925	7.325**
Monessen P7(48)	6.675	7.225
Palmer W12	6.975	7.375†
Pitts.,Calif. C11	7.625	8.025†
Portsmouth,O.P12	6.675	....
Rankin A7	6.675	7.075†
So.Chi'go R2	6.675	7.075**
S.S.Frn.(48)C10	7.625	8.025**
Spar'wsPt.B2(48)	6.775	7.325*
Steri'g(1)(48)N15	6.675	7.20
Struthers,O. Y1	6.675	7.175
Worcester A7	6.975	....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga.	Col.
Ala.City,Ala. R2	140**
Ala.City, 17 ga. R2	235**
Ala.City, 18 ga. R2	245**
Aliq'ppa,Pa.9-14½ga.J5	143*
Atlanta A11	145
Bartonville,Ill. K4	145
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga.,6"B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	143

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

WIRE, Barbed	Col.
AlabamaCity R2	153**
Aliquippa J5	150*
Atlanta A11	158
Bartonville,Ill. K4	158
Crawfordsville,Ind. M8	158
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156*
Joliet,Ill. A7	153†
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155†
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
S.SanFrancisco C10	176**
SparrowsPoint,Md. B2	156*
Sterling,Ill. (1) N15	156

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE (16 gage) Stone	An'ld. Galv. Stone
Ala.City R2	12.50	14.05**
Aliquippa J5	12.50	14.30*
Bartonville K4	12.60	14.40
Buffalo W12	12.50	....
Cleveland A7	12.50	....
CrawfordsvilleM8	12.50	14.30
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35*
Kokomo C16	12.60	14.15†
Minnequa C10	12.75	14.45**
Palmer,Mas.W12	12.50	14.06†
Pitts.,Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45*
Sterling(1) N15	12.50	14.30
Waukegan A7	12.50	14.06†
Worcester A7	12.50	....

* Based on 11c zinc; † 8c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	133
Bartonville,Ill. K4	133
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. K4	135
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2 I-2..	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	146
Johnstown,Pa. B2	146
Marion,O. P11	146
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	145
Williamsport,Pa. S19	148

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		22c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	16.5	34.75	19.5
Alton, Ill. L1 (‡)	...	...	....	...	....	....	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Butler, Pa. F6	26.5	—1.75	19.5	+2.75	12.5	+6.25	....	..	....	..	....	....	....	....	....	....
Etna, Pa. N2 (†)	...	...	....	...	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fairless, Pa. N3	...	...	....	...	....	....	24.25	..	27.25	..	29.75	...	32.25	....	32.75	....
Fontana, Calif. K1 (‡)	...	...	....	...	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	....	...	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	....	...	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (‡)	26.5	—0.25	19.50	+4.25	12.5	+8.5	....	..	....	..	....	....	....	....	....	....
Sharon, Pa. M6	...	...	....	...	....	....	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 (‡)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	....	...	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20.0	34.75	21.0
Youngstown Y1 (††)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (‡)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill. L1 (‡)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
Benwood, W.Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fairless, Pa. N3	33.25	....	34.75	....	34.75	...	25.75	....	25.75	....
Fontana, Calif. K1 (‡)	23.25	7	22.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	....	....	....	....
Sparrows Pt., Md. B2 (‡)	33.25	16	34.75	16	34.75	16	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	21.5	36.75	21.0	36.75	21.0	27.75	11.5	27.75	11.5
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill; minimum wall thickness, cut length 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.02	16.44
1¼	13	....	22.53	18.12
1½	13	20.65	24.91	20.01
1¾	13	24.40	29.43	23.66
2	13	27.34	32.96	26.51
2¼	13	30.80	37.15	29.86
2½	12	33.42	40.32	32.41
2¾	12	36.82	44.41	35.70
2¾	12	39.87	48.09	38.66
3	12	42.62	51.26	41.23

RAILWAY MATERIALS

	Std. No. 1	Std. No. 2	Std. Toe Rails All No. 2	60 lb Under
RAILS				
Bessemer, Pa. U5	4.325	4.225	4.275	5.20
Ensley, Ala. T2	4.325	4.225	....	5.20
Fairfield, Ala. T2	....	....	....	5.20
Gary, Ind. U5	4.325	4.225	4.275	...
Huntington, W.Va. W7	....	....	....	5.20
Indiana Harbor, Ind. I-2	4.325	4.225	4.275	...
Johnstown, Pa. B2	....	....	...(16)	5.20
Lackawanna, N.Y. B2	4.325	4.225	....	5.20
Minnequa, Colo. C10	4.325	4.225	....	5.70
Steelton, Pa. B2	4.325	4.225	....	...
Williamsport, Pa. S19	....	....	....	5.20

TIE PLATES

Fairfield, Ala. T2 ..... 5.125
Gary, Ind. U5 ..... 5.125
Ind. Harbor, Ind. I-2 ..... 5.125
Lackawanna, N.Y. B2 .. 5.125
Minnequa, Colo. C10 ... 5.125
Pittsburg, Calif. C11 ... 5.275
Seattle B3 ..... 5.275
Steelton, Pa. B2 ..... 5.125
Torrance, Calif. C11 ... 5.275

TRACK BOLTS (20) Treated

Cleveland R2 ..... 11.00
KansasCity, Mo. S5 .... 11.00
Lebanon, Pa. B2 ..... 11.00
Minnequa, Colo. C10 .... 11.00
Pittsburgh O3, P14 .... 11.00
Seattle, Wash. B3 ..... 11.50

JOINT BARS

Bessemer, Pa. U5 ..... 6.275
Fairfield, Ala. T2 ..... 5.275
Ind. Harbor, Ind. I-2 ... 5.275
Joliet, Ill. U5 ..... 5.275
Lackawanna, N.Y. B2 .. 5.275
Minnequa, Colo. C10 ... 5.275
Steelton, Pa. B2 ..... 5.275

AXLES

Ind. Harbor, Ind. S13 .... 6.50
Johnstown, Pa. B2 ..... 6.50

STANDARD TRACK SPIKES

Fairfield, Ala. T2 ..... 7.05
Ind. Harbor, Ind. I-2, Y1 7.05
KansasCity, Mo. S5 .... 7.30
Lebanon, Pa. B2 ..... 7.05
Minnequa, Colo. C10 .... 7.05
Pittsburgh J5 ..... 7.05
Seattle B3 ..... 7.55
So. Chicago, Ill. R2 ..... 7.05
Struthers, O. Y1 ..... 7.05
Youngstown R2 ..... 7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
⅞-in. under ..... 26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:
½-in. & smaller diam. 4
⅝-in. & ⅝-in. 5
¾-in. and larger 3
Longer than 6 in.: ..
All diams. ..... +4
Lag bolts, all diams.:
6 in. and shorter.... 12
Over 6 in. long 8
Ribbed Necked Carriage 5
Blank 25
Plow 25
Step, Elevator, Tap and Sleigh Shoe 12
Tire Bolts ..... List
Boiler & Fitting-Up Bolts 20

NUTS

H.P. & C.P., regular & heavy:
Square, all sizes 58
H.P., Hex, regular & heavy:
¼" and smaller 58
⅜" to 1⅛", inclusive. 60
1¼" to 1½", inclusive 62
1⅝" and larger 56
C.P. Hex regular & heavy:
All sizes 56
Hot Galv. Nuts (all types):
¼" and smaller 40
⅜" to 1½", inclusive. 43
Finished Hex Nuts:
New standard, all sizes 58
Semifinished & Slotted Hex:
Regular and heavy, all sizes 56

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 34
1 in. and smaller diam. x over 6 in. 20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 34
¼ in. diam & larger.... 14
N.F. thread, all diams.. 8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish .....47.5 x 10
Plated finishes .....30 x 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
⅝-in. & smaller 38
⅞-in. through 1 in. .. 23
Longer than 6 in.:
⅝-in. and smaller ... 20
⅞-in. through 1 in. .. 7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge Iron:	
98+% Fe, annealed.	18.00
Unannealed	
Minus 100 mesh ..	14.50
Minus 96 mesh ..	10.50
Minus 20 mesh ..	10.00
Swedish, c.l.f. N. Y., c.l., in bags	11.35
Domestic (Swedish), f.o.b. Riverton, N. J., in bags....	11.25
Electrolytic Iron:	
Melting stock, 99.91% Fe, irregular fragments of ¼ in. x 1.3 in.	28.00
Annealed, 99.5% Fe.	43.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	38.50
Powder Flakes (minus 16, plus 100 mesh)..	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns..63.00-148.00	
Aluminum:	
Atomized, 500 lb drums, frgt. allowed:	
Carlots	31.00
Ton lots	34.00
Antimony, 500 lb lots	23.00*
Brass, ¼-ton lots .....28.75-37.50†	
Bronze, ¼-ton lots .....59.00-69.00‡	
Copper:	
Electrolytic 13.50*	
Reduced 12.50*	
Lead	7.50*
Magnesium 54.00-56.00	
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed ...	99.50
Nickel-Silver, ¼-ton lots .....44.00-49.00§	
Nickel-Silver, ¼-ton lots 46.75**	
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	8.50*
Stainless Steel, 302 ...	91.00
Tin 14.50*	
Zinc, ¼-ton lots.15.00-26.75‡	
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over...	4.25
Less than 1000 lb ..	5.10
Chromium electrolytic 99.9% Cr min, ...	3.50

*Plus cost of metal, †Depending on composition, ‡Depending on mesh, §70% Cu, 20% Zn, 10% Sn. **64% Cu, 18% Zn, 18% Sn.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.55c; 1 15/16" to 2 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c for H.S.-L.A.
(31) Base; deld. within mill county.
(32) Buffalo base.
(33) To jobbers, deduct 30c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6-7 gage.
(49) T-post; deduct 2 cols for U-post.

STAINLESS STEEL MILL PRICES

(Representative prices cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	38.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	41.50	41.50
302B ..	18.50	24.50	30.50	34.50	35.00	35.50	37.50	44.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	46.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	43.75	43.75
304L ..	....	....	36.75	....	....	42.75	45.25	49.00	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	48.00	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	62.00	62.00
309S ..	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	62.75	67.50	69.00	72.25	72.25
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	53.25	55.50	59.00	62.75	62.75
316L ..	....	....	52.50	....	58.25	61.00	64.25	67.75	67.75
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	77.00
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	80.25	80.25
321	22.75	29.50	35.25	40.75	41.00	42.00	46.00	50.50	50.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	59.25	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	34.25	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F ..	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	35.25	35.25
440A,B,C		28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	50.25	39.50	40.75	59.75	59.75
501	....	....	14.00	14.50	21.25	16.00	18.25	29.00	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	30.00	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.80	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel ..	41.23	54.18	.....	165.00
Nickel ...	37.50	50.90	.....	....
Monel ...	38.90	51.80	.....	....
Copper* ..	....	.....	46.00	....

Strip, Carbon Base	Cold Rolled: 10%	Cold Rolled: Both Sides	Hot-Rolled: 10%	Hot-Rolled: Both Sides
Copper* ..	27.85	35.85	24.00	32.25

* Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; Copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work ...	0.39
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work ..	0.42-.43
Oil Hardening ..	0.37-.390	Hi-Carbon-Cr ...	0.665-.70

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	3.875
18.25	4.25	1	4.75	...	2.160-2.320
18	4	2	9	...	2.515
18	4	2	....	...	1.640
18	4	1	....	...	1.480
13.5	4	3	....	...	1.735
6.4	4.5	1.9	....	5	1.006-1.056
6	4	3	....	6	1.240
2	1.4	1.2	....	...	0.495
1.5	4	1	....	8.5	0.885-0.895

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R3, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, del.	66.65	67.15	67.65	....
Rochester,N.Y., del.	59.02	59.52	60.02	....
Syracuse,N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon,Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, del.	....	62.26	62.76	....
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro, Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, del.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, del.	57.37	57.87	57.87	58.37
McKeesRocks, del	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, del.	57.66	58.16	58.16	58.66
Verona,Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.75	61.25	61.75	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	56.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

* Low phos. southern grade. † Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; and $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$87.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	96.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, del.	64.00
Troy,N.Y. R2	64.00

Here's Enduro Stainless Steel Quality for only 9% more cost

That's the experience of the Guardian Locker Division of The Flxible Company, Millersburg, Ohio. They're making and selling public rental lockers. They use ENDURO Stainless Steel for all exterior sections, and for interior bottom sections —at the place where wear is heaviest. They're making coin receivers and lock parts of ENDURO, too.

Cost is only 9% more than it would be for the same locker made of plain carbon steel, painted. Revenue increases from the stainless steel lockers are reported to range from 15% to 40%.

Women particularly are attracted by the bright, clean-looking ENDURO finish. It has a psychological "sell". And, ENDURO naturally is easier to maintain. Easy to keep clean and bright looking. ENDURO will not tarnish. It resists abrasion and denting. It has no applied surface to chip, peel, or wear away. It lasts long. It is easy to fabricate.

Here's more proof that ENDURO brightwork sells. That it appeals to everyone. It can do the same for your products. Republic metallurgists will help you apply ENDURO's "bonus benefits" to step up interest and sales power . . . efficiently and economically. Just write:

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

REPUBLIC STEEL
REPUBLIC
ENDURO STAINLESS STEEL

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Erie, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS				Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Bds.	C.F. Bds.‡	H.R. Alloy 4140††‡			Carbon	Floor
Baltimore	6.20	7.12	7.75	7.00	...	6.86	8.17‡	12.04		6.98	6.86	7.98
Birmingham	6.10	7.00	8.00§	6.30	...	6.15	8.90	....		6.35	6.35	8.25
Boston	6.80	7.83	9.18	7.13	...	6.87	8.35	12.13		7.06	7.13	8.30
Buffalo	6.18	7.15	8.70	6.79	...	6.35	7.70	12.02		6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....		7.10	7.10	8.37
Chicago	6.18	7.12	7.95	6.43	...	6.28	7.30	11.60		6.44	6.33	7.46
Cincinnati	6.30	7.11	8.20	6.66	...	6.52	7.60	11.85		6.64	6.62	7.71
Cleveland	6.18	7.12	8.25	6.58	...	6.34	7.40	11.74		6.79	6.50	7.63
Detroit	6.38	7.29	8.23	6.69	7.38	6.56	7.50	11.97		6.91	6.80	7.80
Erie, Pa.	6.15	...	8.15	6.45	...	6.23	7.50‡	....		6.46	6.23	7.46
Houston	7.15	7.60	9.23	7.46	9.30	7.45	9.30	....		7.25	7.20	8.55
Los Angeles	7.25	8.60	8.55	7.55	11.20	7.15	9.10	13.05		7.35	7.20	9.26
Milwaukee	6.35	7.39	8.12	6.59	...	6.45	7.57	11.77		6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.30	6.77	...	6.63	7.65	....		6.81	6.68	...
New York	6.78	7.52	8.37	7.16	...	7.06	8.43‡	11.99		6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.00	...	7.00	8.50	....		7.00	7.00	7.85
Philadelphia	6.35	7.13	7.87	7.02	8.80	6.87	8.19‡	11.74		6.67	6.63	7.66**
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.60		6.46	6.23	7.46
Portland, Oreg.	7.60	8.45	9.05	7.05	...	7.35	10.65	....		7.25	7.30	9.15
Richmond, Va.	6.50	...	8.67	7.10	...	7.05	8.20	....		7.10	6.85	8.30
St. Louis	6.48	7.43	8.25	6.72	...	6.58	7.70	11.90		6.86	6.73	7.86
St. Paul	6.84	7.78	8.61	7.08	...	6.94	8.06	....		7.13	6.99	8.13
San Francisco	7.35	8.70	8.95	7.80	...	7.15	9.75	12.90		7.25	7.20	9.35
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50		7.50	7.60	9.40
Spokane	8.15	9.40†	9.80	7.60	...	7.60	10.55‡	14.10		7.25	7.35	9.40
Washington	6.71	7.65	8.35	7.51	...	7.37	8.43	....		7.49	7.36	8.49

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier, add 0.34c for 12 gage and lighter. ††as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; ‡—500 to 9999 lb; ‡—1000 to 1999 lb; ‡—1000 lb and over; ‡—1500 lb to 3999; ‡—under ½ in.

Distributors Book 3rd Quarter Orders

Gradual improvement in warehouse steel sales continues as fabricators replenish supplies in anticipation of mill shutdowns for summer vacations

Pittsburgh—Increase in orders continues gradually, with reports of incoming volume for July and August. Forward ordering is in anticipation of summer vacation shutdowns and is not prompted by a steel strike threat.

Sheet fabricators continue to bypass warehouses when they can receive quick delivery from mills. While sheet and strip price weakness continues, prices of other products are stable. Plate sales are gaining in volume, but main sales leaders are tin plate and wide flange beams.

Cleveland—May warehouse order volume generally is about on a par with that in April though some distributors say the Memorial Day slackening may result in dropping the total for the month slightly below that of both April and March.

Consumers are ordering largely against needs and with warehouse inventories in the best shape they have been in years competition for tonnage is keen.

Prime sheets, both hot-rolled and cold-rolled, are moving slowly, this, in part, being explained by continued strong competition from secondary material.

Boston — In its initial stages, a steel strike would help the warehouses, but not in the long run. They might liquidate current inventories more expeditiously, but the bugbear of replacement would return. Actually, distributors are slowly, but steadily, getting stocks down to balance and more replacement orders are being placed on a month-to-month basis. Slow to move are off-grade and certain unpopular size items taken in late last year. Even price concessions are not the answer to moving such material. Moderate improvement in total sales is expected through June.

Philadelphia — Warehouse trading is fair and moderately steady. Some

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, A8TM-A-305	$4.55	$4.55	$4.50	$4.83
Bar Size Angles	4.40	4.40	4.35	4.68
Structural Angles	4.40	4.40	4.35	4.68
I-Beams	4.40	4.40	4.35	4.68
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft. ⅞ x 0.30 lb per ft	25.50	25.70	25.50	26.34
Barbed Wire	6.60	6.60	6.60	6.68
Merchant Bars	4.55	4.55	4.50	4.83
Hot-Rolled Bands	4.70	4.70	4.65	4.98
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.58
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.88

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

distributors believe that May business will show little change from April. June business also may be fairly sustained, although some look for a dip toward end of the month as a prelude to slower trading generally in July and August when volume is usually affected by vacations and hot weather. Except possibly shapes, there is little in the way of special demand in any of the major products. As for shapes, distributors have no difficulty at all in supplying standard sections, and not very much in supplying wide flange beams.

Chicago—Although steel warehouses are inclined to measure current activity against the feverish rates of a year ago and emphasize the shrinkage in volume, they invariably sum up saying things are not too bad. Naturally, the readjustment has been painful, but it has been healthy.

Seattle—Warehouse business continues to improve but the increase is not up to seasonal expectations. Buying is confined to immediate needs of consumers. Some houses report wide flange sections still are in tight supply. Prices are stable in this area.

Los Angeles — Quicker deliveries from mills have pushed warehouse stocks above 100 per cent of normal. Wide flange beams continue in strong demand.

Semifinished Steel . . .

Semifinished Prices, Page 140

Youngstown—The district steel ingot rate is unchanged at 68 per cent of capacity with two bessemer converter plants, 46 open hearths and 13 blast furnaces in production. U. S. Steel Corp.'s Ohio Works has added an open hearth to the active list, giving it 9 out of 15 units in operation. It is operating its bessemers six turns weekly. On the other hand, Republic Steel Corp.'s Youngstown Works took off two open hearths, now operating 7 out of 15, and its bessemer converters 9 turns weekly.

Wheeling — Strong sales of tin plate and galvanized sheet contribute to a steady increase in the operating rate of this district. This week operations in the area stand at 83.5 per cent, an increase of 1 per cent from last week. Operations have been over 80 per cent of capacity in this area for six weeks.

San Francisco — Production at Kaiser Steel Corp.'s Fontana Works is running near capacity in a speed-up designed to make up ground lost in the recent wildcat strike.

Quotes C-F Bars on Delivered Basis

Republic Steel Corp. extends new pricing method to cold-finished carbon grades. Initiated method on hot-rolled bars last December. Bookkeeping is facilitated

Cleveland — Republic Steel Corp. extended its new delivered pricing system to cold-finished carbon bars, effective May 24. The company has been quoting hot-rolled carbon bars on a delivered basis since Dec. 15, 1953. The system is to be extended to other products.

The company produces cold-finished bars at five principal points: Beaver Falls, Pa., Gary, Ind., Hartford, Conn., Massillon, O., and Los Angeles. It has established a new mill base price for cold-finished bars at the following points: Beaver Falls, $5.26 per 100 lb; Gary, $5.27; Hartford, $5.70; Massillon, $5.24.

It will deliver to any railroad destination within the county or counties covered by the switching area immediately adjacent to each of the above producing points in 80,000-lb minimum carloads at these base prices.

Delivered prices have likewise been established from each of Republic's cold-finished bar mills for all counties (except the West Coast area) into which shipment is customarily made.

Because of transportation problems peculiar to the West Coast area two mill base prices have been established at the Los Angeles plant: $6.65 or $6.96 per 100 lb dependent on size or grade. A delivered pricing method has also been established for the West Coast that takes into consideration such peculiar transportation problems.

At all of Republic's producing points the customer is given a choice of all feasible methods of transportation; for example, in many counties, prices are shown for 80,000-lb rail delivery, 40,000-lb rail delivery 32,000-lb truck delivery and 20,000-lb truck delivery. In areas where different minimum weights are applicable this factor has been taken into consideration.

Price lists covering all such conditions are being distributed to customers. As a result, the company's delivered base price is instantly available to the customer from published material without the necessity for his computing transportation charges. In addition, the customer can determine from published information exactly what products, size ranges, etc. are produced at each of Republic's mills, and which mill has the lowest delivered prices to his plant.

Under the plan, the customer is relieved of the bookkeeping requirements involved in handling transportation charges. He will have no freight damage claims to prosecute and no transportation to arrange.

In announcing the pricing change, Norman W. Foy, vice president of sales, said the delivered cost to cold-finished bar customers would be substantially the same under the new procedure as under the old. In some cases, he said, there may be slight reductions and in others slight increases, but in neither case is the change significant.

The Big Squeeze

Lukens Steel Co.'s big 206-in. mill is rolling a 47.5-ton plate from an ingot measuring 123 in. by 108 in. by 40 in. Maximum sizes available include plates 800 in. long, or up to 195 in. wide, or 25 in. thick, in combinations to 48-ton maximum weight

Steel Bars . . .

Bar Prices, Page 140

New York—Hot carbon bar business continues disappointing to sellers. There is little gain in demand, with buying still on a hand-to-mouth basis. Consumers have come to count on prompt deliveries and in many cases are waiting until the last minute before making new commitments.

Eventually, mill deliveries will become more extended, and when that time comes it will probably be found

that many buyers have let their inventories become too much out of balance and a flurry of buying may reasonably be expected to set in.

Boston—Cold-finished carbon bars, delivered Boston from Republic's Union Drawn Division mill, Hartford, Conn., is 5.86c; also from Worcester and Providence. At some points, county delivered price, based on 5.70c, Hartford, is slightly higher than nearest competition and in such cases cost to consumer will be equalized.

Carbon bar bookings, hot and cold-rolled, are up slightly.

Philadelphia — Hot-rolled carbon bar demand remains sluggish, although the decline in defense requirements appears to have definitely leveled off with some indications of an increase over coming weeks. The situation at district arsenals is coming in for a survey. At the local Midvale plant a $3,321,000 Army contract has been received for mass production of high-explosive shells for the atomic cannon. These shells will require forgings in excess of 11 inches in diameter.

Pittsburgh — Warehouses continue to buy small quantities of cold-finished bars. With no likelihood of a sales pickup producers say appliance makers are gradually returning to the market after leveling off inventories.

Iron bar shipments to railroads continue to decrease, but a summer pickup is expected in sales to industrial engineers.

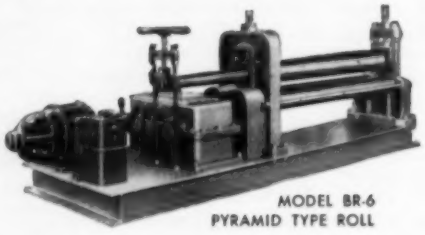
Cincinnati—Supplies of carbon and alloy bars remain plentiful. Demand for carbon bars in May was a little better than in April; that for alloy has shown little change for three or four months.

Chicago—Steel bar demand is picking up moderately in this area to follow the general pattern for steel products. The stronger activity embraces alloy as well as carbon hot-rolled and cold-finished.

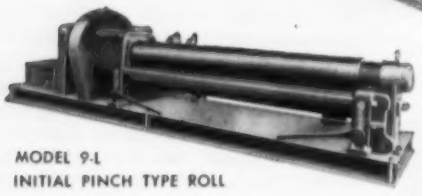
WEBB PLATE FABRICATING MACHINERY

PLATE BENDING ROLLS

The Webb Corporation offers a complete line of Plate Bending Rolls for the rolling of the thinnest plate up to plate 2½" thick. Offered in a variety of lengths and thicknesses. Constructed for the modern fabricating shop.



MODEL BR-6
PYRAMID TYPE ROLL

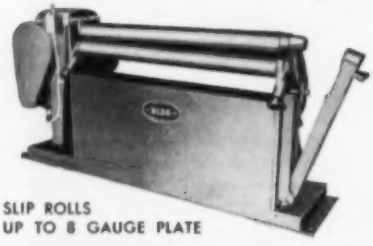


MODEL 9-L
INITIAL PINCH TYPE ROLL

Two types available: the Initial Pinch Type and Pyramid Type machines. All latest advantages of today's modern machine tools are incorporated, utilizing anti-friction bearings, totally enclosed gear drives. Special forming rolls for culvert pipe, stock tanks and other special shapes available.

SLIP ROLLS

A complete line of small Sheet Metal Forming Rolls are also available. All power-driven with shaft sizes 3" to 5" for the handling of the thinnest gauge material, up to 8 gauge material. Special rolls for the forming of polished sheets, aluminum and stainless steels can be furnished. Complete catalogues on any size machine furnished upon request; write Dept. D.



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Sheets, Strip . . .

Sheet and Strip Prices, Page 140 & 141

Newport, Ky.—Further increase in its facilities and diversification of its end products are planned by Newport Steel Corp., recently acquired by Merritt-Chapman & Scott Corp. Carl Riefkin, vice president in charge of sales, lists the following facilities currently under construction or recently completed:

Construction of a reversing mill for cold-rolling steel, scheduled for operation early next year; installation of additional facilities in the reversing hot mill, due for completion this summer; installation of a continuous pickling line, placed in operation last June; erection of barge loading and unloading facilities fronting the Licking river at the company's Wilder, Ky., plants; construction of an electric pipe mill; installation of three additional electric furnaces and a reversing hot mill.

Installation of the cold-rolling mill will add cold-rolled sheets and coils to Newport's list of products which includes: Hot-rolled steel in coil and sheets; hot-rolled pickled steel in coil and sheets; electrical sheets; electric weld line pipe; galvanized sheets; galvannealed sheets; colorbond sheets; alloy sheets and plates; roofing and siding; eave trough and conductor pipe; culverts.

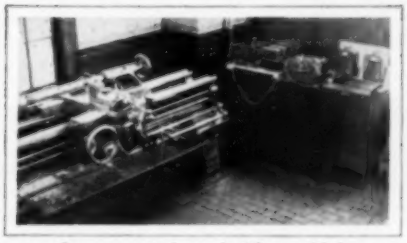
New York—Sheet buying shows further slight gain, with the specialties, relatively, more active than the heavy tonnage items, notably hot and cold carbon sheets. Enameling stock, stainless and electrical sheets are moving at a definitely better rate

Now . . . Picture These Advantages for Your Tools and Dies!

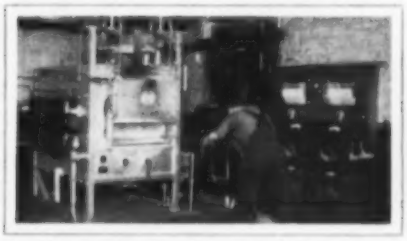
Make this *3-Minute Check* . . . Discover what has been put into a *dependable* die steel to help you get better die performance, lower costs!

Improving existing die steels and developing new ones to meet the need for lower production costs, has been a challenge met by Carpenter. The results are modern die steels that heat treat and machine easier to save time and money; run longer between grinds to reduce unit costs. Here are facts about *Stentor* (Oil-Hard) Die Steel—one of 12 modern steels in Carpenter's well-known Matched Set. Check what *Stentor* offers . . . compare it point by point with the die steel you now use. We believe you'll agree: Here is a real opportunity to put your tooling ahead of competition, take a big step to high quantity output at reduced unit costs.

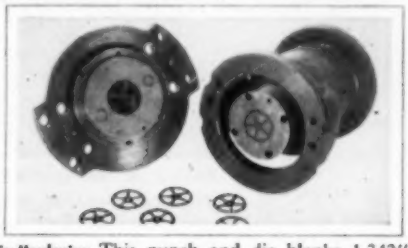
Here is what *Stentor* gives you . . . *COMPARE* it with the die steel you use . . .



Easy Machinability. Two steels were put through this machining test. One, a well-known oil-hardening tool steel; the other, *Stentor* with its simplified analysis. Bars tested were 3½" rd. with same Brinell hardness and structure. Result: With a cut .020" deep, *Stentor* proved to be 11% easier to machine than the other steel. Does the steel you use provide this *extra economy* in machining?

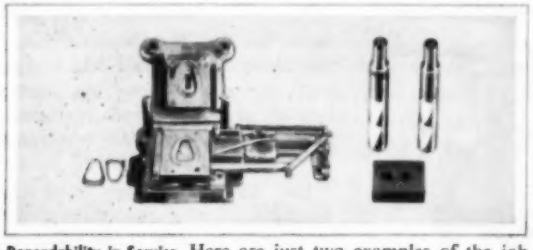


Simplified Heat Treating. Because of *Stentor's* simplified analysis, it hardens from the low temperature of 1420° to 1450°F. This low temperature reduces dangers of size change and decarburization—holds warpage to an absolute minimum. How does the steel you use compare with this?

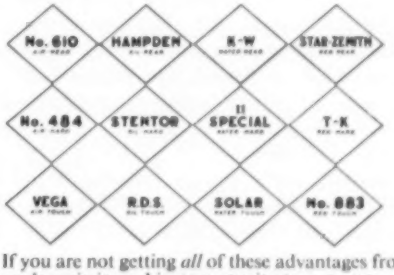


Safety and Accuracy in Hardening. This punch and die blanks 1.342" dia. timing mechanism gears having 120 teeth/90 pitch, made from 24 ga. ¾-hard brass. Customer reports: "In heat treatment the *Stentor* die moved only .0005" on the max. dia. of the gear!" If the oil-hardening steel you use doesn't behave like this, it's time to change to *Stentor!*

Freedom from Decarburization. Here is a *Stentor* part as quenched and before drawing, showing absence of soft skin. This test proves that *Stentor* tools when properly hardened are hard enough, right on the surface, to scratch glass! Does the steel you use give you this *positive* freedom from decarb?



Full Dependability in Service. Here are just two examples of the job *Stentor* does day after day in service. Die on left gave *83 continuous* hours of production between grinds compared to *10 hours* with a chrome-tungsten grade! The ¼" dia. punches shown to right above punch ¼" thick SAE 1020 steel. After *Stentor* was used production went up 160%. How much *more* output could you add to your total with *dependability* like this?



If you are not getting *all* of these advantages from the steel you use, you're missing a big opportunity to cut costs, raise output!

change to Carpenter STEEL

Matched Tool and Die Steels

. . . *modern* die steels engineered to meet *today's* requirements!

The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.
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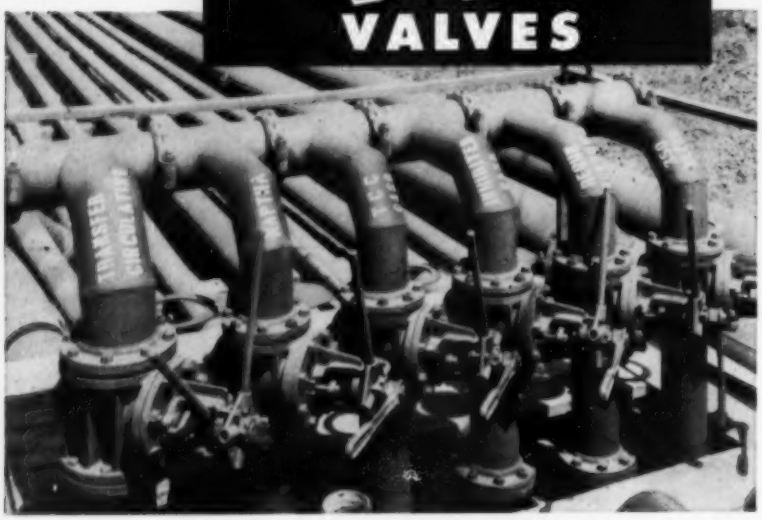
Get Immediate Delivery . . . Call your Carpenter Mill-Branch Warehouse, Office or Distributor.

★ positive, DROP-TIGHT shut-off

★ instant STICK-PROOF operation

"built-in features of"

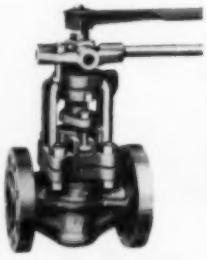
HOMESTEAD
Lever-Seald
VALVES



Built right into every HOMESTEAD LEVER-SEALD VALVE is a powerful lever-and-screw device that either firmly seats the valve, or relieves seating pressure just enough to overcome friction and permit easy operation. For this reason, hard-to-hold fluids or extremes of temperature and pressure cannot cause a HOMESTEAD LEVER-SEALD VALVE to stick or "seize."

Instant, dependable operation, long service life, and extremely low maintenance cost are assured by this exclusive HOMESTEAD design. All vital operating parts and seating surfaces are protected from the corrosive or erosive effects of line fluids. No lubrication is required, but valve may be pressure gun lubricated if desired.

HOMESTEAD LEVER-SEALD VALVES are available in metals and alloys to specification; sizes 1½" to 12"; from vacuum to 1500 lbs.; temperatures from 40° below zero to 1100° F.



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and delivery promises are becoming a bit more extended.

Consumer inventories in all grades are being steadily reduced. However, in carbon sheets deliveries can still be had in short time.

Boston — Flat-rolled steel orders are slightly higher with the buying pattern unchanged. Consumers are ordering limited tonnage for prompt shipment.

Depleted inventories force more consumers to patch up stocks, but third quarter prospects are not promising.

Philadelphia—If there is any buoyancy in demand for any major steel products in this area, sheets are coming in for their share of it. While the two principal tonnage items, hot-rolled and cold-rolled sheets, show little appreciable gain, there is some stepping up in specialties.

Pittsburgh—Only scattered indications are noted of sheet consumers building inventories against the eventuality of a steel strike. Most users, including automakers, have similar requirements in May as in April.

Cleveland—Consumers continue to order sheets and strip sparingly, largely for needs in sight. Volume, however, reportedly is up somewhat in the case of some mills though buying is not spirited. Approaching summer vacation season is seen as one factor working against the building up of inventories by consumers.

Cincinnati — Heavier gage sheets show signs of being in a little tighter supply. Heaviest inventories are in the lighter gages.

Chicago — Galvanized sheets continue as the top demand item in the flat-rolled product line. Apparently it results from the combination of needs for grain storage bins with normal seasonal requirements for construction and farm uses.

Los Angeles—Kaiser Steel Corp., Fontana Works, reopened its cold-strip mill after a three week shutdown for installation of gas furnaces.

Wire . . .

Wire Prices, Page 143

Boston—While wire buying for industrial use is not impressive, May orders are slightly heavier than for April and are on a broader base. Prompt shipment is specified for the bulk of volume. Consumer inventories in most cases are worked down to the point where most wire purchased is for production. Although some orders are predicated against possible production suspension this summer, volume is limited.

When some brick sell for as little as 10¢ each . . .

Why is this brick worth $1.70?

Suppose you put a muffle arch of these $1.70 brick in a furnace and — as a direct result — *doubled productive capacity*. Suppose you put them in the floor of another and it *lasted 50 times longer*. Suppose you put them in the hearth of a third and *eliminated 30 days downtime* in one year. Then at $1.70 apiece these brick would be a terrific buy. And are. Because these figures come from real, live companies! Companies that replaced ordinary refractories with CARBORUNDUM's super refractories!

Granted, you can't always get such spectacular results. But you usually get a combination of benefits. For example, by lasting longer, CARBORUNDUM's refractories automatically cut costly downtime losses . . . and maintenance expense . . . and labor. And by using heat more efficiently, you not only increase production . . . but cut fuel costs . . . and cut rejects. In short, their value is more — much more — than just to resist heat.

So if you could use a material that is far harder than metals . . . or one that conducts heat nearly as rapidly as chrome-nickel steel . . . or another that insulates well at temperatures above 3000 F — we have them. These "man-made minerals" range from a ceramic fiber (looks like cotton), to a superdense refractory that's cast, like a metal. And our engineers can show you how to combine these materials to exploit their complete range of properties.

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Address _____

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Plates . . .

Plate Prices, Page 140

Philadelphia—Plate business shows little, if any, improvement. Orders are on a hand-to-mouth basis, and some producers believe that third quarter will not even be as active as the present three-month period. Unless there are unexpected developments, they believe vacations and hot weather will cause a drop.

Boston — Among fabricators of heavier steel products, plate shops are operating in the most competitive market with prices soft. Weldments and semifabricated work are subject to strong price pressure.

Pittsburgh—Plate fabrication continues at a brisk rate, but a slight falling-off in recent weeks discourages some producers who expected a gain. Construction is active in commercial and highway fields.

Los Angeles—Kaiser Steel Corp., Fontana Works, is expected to be current with delivery promises by July. Shipments have been retarded two weeks due to the 8-day unauthorized walkout in April.

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ROLL FORMING MACHINE

ARDCOR
MODEL 1-F

Spindle Diameter	1½"
Roll Diameter	4¼" to 7"
Horizontal Distance Between Spindles	12"
Roll Space on Standard Machine	10"
Capacity Max.	.072

ADAPTABILITY — Ardcor Standard Forming Machines feature "unit construction" for each stand. Thus production changes are easily and quickly made. With this feature, any length base can be furnished to accommodate additional units as required.

Ardcor Roll Forming machines embody the precision, accuracy and stability found only in the highest grade machine tools. In addition, Ardcor offers a completely engineered installation—cradle reels, roll forming machines, roller dies, flying cut-off fixtures, etc. —from one qualified source.

Likely as not your special shapes can be ideally handled by a standard Ardcor machine. Your inquiry is invited—without obligation.

Also Standard Machines up to 4½" Spindle Diameter.

American ROLLER DIE CORPORATION
29520 Clayton • Wickliffe, Ohio

Tubular Goods . . .

Tubular Goods Prices, Page 143

Pittsburgh—Casing and tubing for oil country use continues to mark up sales records, but other tubular products are moving slowly. Sales of mechanical and pressure tubing are subject to heavy competition.

Tin Plate . . .

Tin Plate Prices, Page 142

Washington—Shipments of metal cans in March totaled 291,063 net tons compared with 260,053 in February and 279,294 in March, 1953, reports the Census Bureau. Cumulative total for the first three months this year was 815,824 net tons, against 801,368 in the like period last year.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 140

Chicago—New construction projects are coming out sufficiently fast here to assure good demand for reinforcing steel products this summer.

Boston—Concrete reinforcing bar prices are under pressure and are $10 to $12 per ton under listed quotations frequently. Volume of tonnage being estimated grows, mostly highways and military installations.

Structural Shapes . . .

Structural Shape Prices, Page 140

Boston—Except for smaller tonnages, 100 tons and under, fabricated structural steel prices are steadier. Most district shops have three months or more backlog while larger units are not pressed for work to warrant price shading. Competition is sufficient, however, to hold prices below engineer estimates for most projects.

Pressure for plain material is off.

The leading producer of bar shapes is equalizing on delivered prices on sizes to 3-inch, including angles and channels from Pittsburgh. This is the first reported freight absorption on structural material.

Philadelphia — Structural steel awards have been light lately but various jobs are active with competition keen among fabricators. On an average backlogs are fairly good, but not to be compared with a year ago this time, and shops are striving to build them up.

Seattle—Larger fabricating plants report backlogs extend into fourth quarter. Some smaller shops, however, are in need of new business.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1430 tons, state highway bridges, Orange county, New York, to Phoenix Bridge Co., Phoenixville, Pa.; Carlos Bianchi & Co. Inc., Framingham, Mass., general contractor.

580 tons, structural work, Philadelphia Electric Co., Hatboro, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

450 tons, hangar, airfield base, Niagara Falls, N. Y., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Joseph Bennett Co Inc., Brookline, Mass., general contractor.

250 tons, Bureau of Roads bridge, Lewis county, Washington, to Bethlehem Pacific Coast Steel Corp., Seattle; C. M. R. Construction Co., Seattle, general contractor, $122,457.

180 tons, school, Academy of Sisters of Mercy, Gwynedd, Pa., to Max Corchin & Son, Philadelphia.

STRUCTURAL STEEL PENDING

4000 tons, operations buildings and hangars, Air Force base, Dover, Del., Corps of Engineers, Philadelphia; bids close June 10. Previously noted as involving smaller tonnage.

2500 tons, double cantilever hangar, Sewart Airfield Base; bids June 10, Corps of Engineers, Nashville, Tenn.

2400 tons, Pennsylvania railroad terminal improvements, Pittsburgh; bids June 4.

1600 tons, state thruway, Westchester county, New York, Corbetta Construction Co. and Yonkers Contracting Co., low on general contract on a joint bid.

1000 tons, state thruway, Erie county, New York, Tomlinson Contracting Co., low on general contract.

1000 tons, Basic Science building for the State Department of Public Works, Syracuse, N. Y., bids closed May 27.

800 tons, city marine transfer station, Greenpoint, Brooklyn, N. Y., bids closed May 26.

770 tons, mostly angles and channels, General Supply Office, Navy, Philadelphia; bids June 4, two inquiries.

765 tons, state bridge work, Cumberland county, Pennsylvania, bids June 11; also required are 330 tons of reinforcing bars.

650 tons, section, state Cross-Bronx expressway, New York, Klevens Contracting Co., Yonkers, N. Y., low on general contract.

600 tons, maternity building, hospital, Abington, Pa., E. H. Keifer & Son, Philadelphia, low on general contract.

500 tons, warehouse, National Can Corp., Baltimore; bids closed May 26.

400 tons, incinerator, Baltimore; bids closed May 26.

250 tons, Sparrows Point junior high school, Baltimore; bids closed.

250 tons, hangar, Hanscomb Airfield Base, Bedford, Mass.

250 tons or more, 2400 lineal feet bridges, Glenn highway, Alaska; Reed & Martin Inc., Fairbanks, Alaska, low $393,072 to Alaska Road Commission, Juneau.

191 tons, Frankfort St. bridge, Philadelphia; city closed bids May 27.

100 tons, 89-foot wide flange beam bridge, Isle La Motte, Vt.; bids June 4, Montpelier.

60 tons or more, three 20-ton vertical lift gates, Bull Run water storage project; bids to city of Portland, Oreg., June 3.

REINFORCING BARS . . .

REINFORCING BARS PLACED

900 tons, 10-story bank and office building, Employers Insurance Co., Phoenix, Ariz., to Kaiser Steel Co., Fontana, Calif.; James Stewart Co., Dallas, Tex., general contractor.

900 tons, Whittier, Alaska, 14-story apartment, to Northwest Steel Rolling Mills Inc., Seattle; Patti-MacDonald Construction Co., Kansas City, Mo., general contractor, low $3,987,052.

600 tons, public garage for System Garage Co., Seattle, to Soule Steel Co., Seattle; Haddock Engineers Ltd., Seattle, general contractors, low $947,538.

REINFORCING BARS PENDING

830 tons, (tonnage reduced in redesign) Whittier, Alaska, Army ocean terminal; bids in at Seattle, May 25.

820 tons, state bridge work, Allegheny county, Pennsylvania, bids June 11.

445 tons, municipal housing project, Lowell, Mass., to be readvertised.

330 tons, state bridge work, Cumberland county, Pennsylvania, bids June 11; also required are 765 tons of structural steel.

Unstated, three buildings, Willamette University, Salem, Oreg.; Vlesko & Post, Salem, low base bid $1,062,900.

PLATES . . .

PLATES PENDING

450 tons, six steel oil barges; bids June 10, Corps of Engineers, Memphis, Tenn.

PIPE . . .

STEEL PIPE PENDING

Unstated, 4600 feet 30-inch wood replacement, Port Townsend, Wash.; bids to Mary Symonds, clerk, June 15 for steel or alternatives.

RAILS, CARS . . .

RAILROAD CARS PLACED

New York Central, 10 siesta coaches, to the Budd Co., Philadelphia.

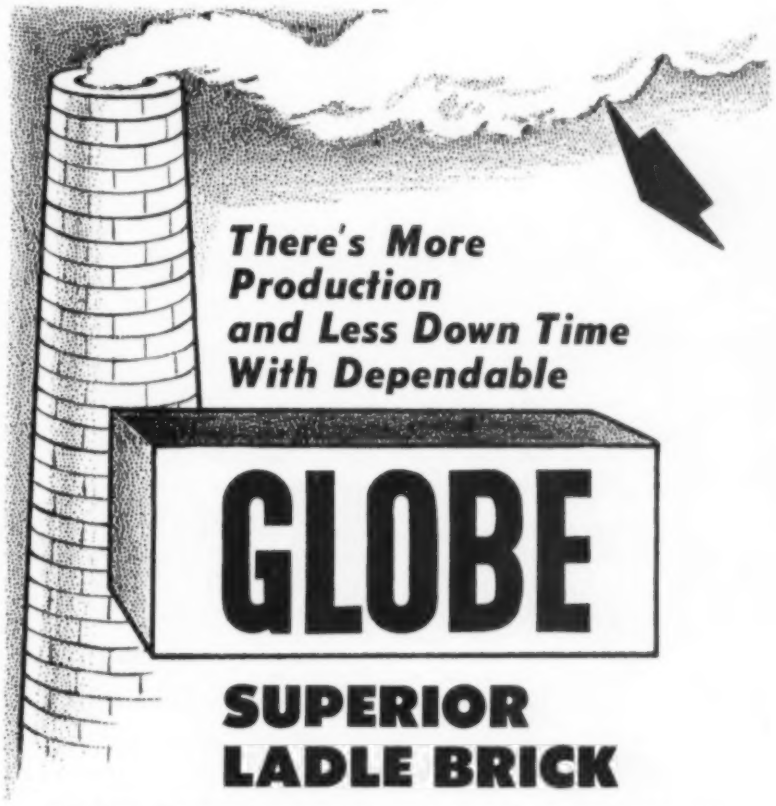
Pacific Fruit Express, 200 seventy-ton mechanical refrigerator cars, to own shops.

RAILROAD CARS PENDING

Department of Interior, Bureau of Mines, Helium Division, Amarillo, Tex., 5 to 20 tank cars for transportation of compressed helium gas, bids June 1.

General Services Administration, Government Emergency Procurement Service, Washington, 5000 standard freight cars for the Indian Railways, India, bids July 14.

Pennsylvania railroad, 50 to 200 piggy-back cars; closing date for bids postponed from May 21 to June 2.



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The GLOBE BRICK Co.
EAST LIVERPOOL, OHIO

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85% C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Min. carloads, 30c; 2000 lb to min. carloads, 32c; 250 lb to 1999 lb, 34c; less than 250 lb, 37c. Premium for hydrogen-removed metal, 1.5c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-55%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 5.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 35-43%, Al 6% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, C.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 60-64%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.06% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 10.8c per pound of contained silicon; 1" x down, bulk 25.25c per pound of contained chromium plus 11c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 2-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primes and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vandium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

35-39% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.40c, ton lot 13.85c, less ton 15.5c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 12.2c per pound contained silicon; carload packed 13.55c; ton lots, 14.75c; less ton, 16.1c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.8c per lb of contained Si, carload packed 15.1c, ton lot 16.25c, less ton 17.5c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Boreosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.
Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 2¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3¼ lb and containing exactly 2 lb of Mn and approx. ¼ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet. Packed c.l. 7.10c, ton lot 7.9c, less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size—Weighing aprox. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.45c. Packed c.l. 7.25c, ton lot 8.05c, less ton 8.95c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 5% max. C 0.4% max). Contract, ton lot, 2" x D, $9.50 per lb of contained Cb, less ton $9.85. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicas Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ¼" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-S Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b, Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots,16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base): carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $70 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

COPPER DETERMINATION

Alloymet 2030 (65% Nickel 30% Copper 5% Iron)*

A product of close Metallurgical CONTROL
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Pre-alloyed master alloys are leaving an indelible mark on the iron and steel industry. The element of human error is reduced many fold, since a single alloying agent, *ALLOYMET* 2030 ingot or shot, can replace many separate inoculants. A single trial of Alloymet 2030 or its companion alloys will make you an "Alloymet regular."

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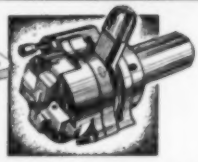

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Application is conveyorized ..... turntable ..... mobile ..... other .....
Average volume of material per gun per hour .....
Type of material ..... Please have representative call .....
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City ..... State .....

The SPEE-FLO CORP.
720 POLK AVE., HOUSTON, TEXAS

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$24.00-25.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.02-$1.05 per long ton unit c.i.f. U. S. ports, duty for buyer's account; 46-47%, $0.95-$0.97.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $100; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $132.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O. $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Peria, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Bilimeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$34.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	*25.00*
Buffalo, deld.	*26.25*
Lone Star Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O. ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	26.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-$47
Birmingham area	45.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

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(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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☐ Gas Fired Unit Heater

☐ Please have a representative call at no obligation to me. Ask for Bulletin HI 598-798

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BUCYRUS, OHIO

Bullishness in Scrap Less Pronounced

Price upturn appears halted for present with buying still restricted. Market tone definitely softer. Purchases on foreign account in East imparting some strength

Scrap Prices, Page 160

Philadelphia—Prices on scrap for domestic account are unchanged, this applying to most cast grades as well as all steel grades. One exception is a decline on No. 1 cupola to $35, delivered.

Domestic buying of open-hearth scrap is largely for shipment to eastern Pennsylvania mills, which have been closing on modest amounts over the past few weeks. Electric furnace bundles and low phos scrap prices are nominal. This is also true of malleable cast, unstripped motor blocks and drop broken machinery.

Some foreign buying of No. 1 heavy melting, No. 2 heavy melting and No. 2 bundles for shipment from this port around June 10 is reported. Prices offered are understood to be $24 f.a.s. for No. 1 heavy melting, $22 for No. 2 heavy melting and $23 for No. 1 bundles. It is said the scrap is sought in units of 925 tons, comprising 350 tons of No. 1 heavy melting, 350 tons of No. 2 and 225 tons of No. 1 bundles.

The scrap is for Yugoslavia, the June shipment possibly amounting to 5000 tons or so. With prices higher than those in the domestic market, they have imparted strength but not enough to result in higher price offerings by domestic mills.

New York—The tone of the market on open-hearth scrap appears easier with most mills seeming to have lost interest. However, brokers' buying prices on these grades continue unchanged and on mixed borings and turnings they are actually higher at $8 to $9. Short shovel turnings also are up slightly at $10.50 to $11 and 18-8 sheets, clips and solids have been boosted to $170 to $175 as result of improved buying interest.

Boston — Slow buying of steel scrap has flattened out prices with orders from district consumers near a standstill. While shipments against the recent mild flurry of ordering are going ahead new buying has slackened for delivery to heavier consuming points. Large yard stocks are not being depleted to any extent. Confusion centers in No. 2 steel and bundles. The pipe foundry is buying some cast iron, but most shops are operating with small inventories, buying truck lots as needed.

Pittsburgh — Minor price adjustments on low volume sales marked the only activity in scrap the past week. Mills continue to require steady amounts of high-quality scrap, but demand for other grades is low. Several major mills are reported to have cut requirements, using larger quantities of hot metal in their operations.

Chicago — Scrap situation has weakened here and although the market is untested opinion is that leading open-hearth grades would not command the prices of a week ago when a leading mill bought a small tonnage of industrial material. No. 1 heavy melting industrial sold then for $32 a gross ton.

Demand at the moment is negligible, the result, no doubt, of Inland Steel Co. relighting an idle blast furnace with the announced intention of using more hot metal and less scrap in furnace charges. Rising scrap prices made the move economically desirable, it stated.

Cleveland—No price change developed in the scrap market here last week. Prices reported on early motor lists were generally in excess of the quoted market, but they had no effect on quotations here. Some of the motor list dealings were of a speculative nature, although consensus among brokers here is that the market has reached its peak for the time being.

Cincinnati—Prices are firm here with exception of low phosphorus which has declined $ 1 a ton to $32-$33 and drop broken machinery which dropped $1 to $45.

St. Louis—Scrap is moving slowly locally. Mills have their own prices out and will take only what is offered at those levels. Rails are in strongest demand with the Chicago mills the biggest buyers. Because many of the Chicago roads enter St. Louis and offer free delivery on their lines, the Chicago mills can buy here competitively. Birmingham also is heavily in this market.

Detroit—Scrap prices are unchanged here but the feeling prevails in the market that further rises will follow the closing of automotive lists. Most scrap is reported moving out of the area, but rising steel operations here lead some sellers to believe stronger local demand will be forthcoming.

Birmingham—Scrap prices, which have shown some strengthening the past several weeks, are holding their own. Orders, however, are few and far between, with scattered, selective buying only reported.

Los Angeles—With mill purchases

(*Please turn to page* 162)

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STEEL SHOT & GRIT CO., BOSTON, MASSACHUSETTS

IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

May 26	$28.17
May 19	28.33
Apr. Avg.	25.67
May, 1953	39.17
May, 1949	22.29

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting...	30.00-31.00
No. 2 heavy melting...	28.00-29.00
No. 1 bundles	30.00-31.00
No. 2 bundles	*26.00-27.00*
No. 1 busheling	30.00-31.00
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*15.00-16.00*
Short shovel turnings..	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals	30.00-31.00
Heavy turnings	*27.00-28.00*
Punchings & plate scrap	*33.00-34.00*
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	33.00-34.00
Heavy breakable cast	*31.00-32.00*
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast..	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 2-ft. and under	*43.00-44.00*
Rails, 18-in. and under	45.00-46.00
Rails, random lengths	*37.00-38.00*
Railroad specialties ...	34.00-35.00

Stainless Steel Scrap
(F.o.b. shipping point)

18-8 bundles & solids..165.00-170.00	
18-8 turnings	85.00-90.00
430 bundles & solids...	65.00-70.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting..	28.00-29.00
No. 2 heavy melting..	24.00-25.00
No. 1 bundles	28.00-29.00
No. 2 bundles	21.00-22.00
No. 1 busheling	28.00-29.00
Machine shop turnings.	12.00-13.00
Mixed borings, turnings	16.50-17.00
Short shovel turnings..	16.00-17.00
Cast iron borings	16.00-17.00
Low phos.	26.00-27.00
Cut structural plate 2 ft and under	34.00-35.00
Alloy free, short shovel turnings	16.50-17.50
Electric furnace bundles	26.00-27.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	27.50-28.50
Stove plate	36.50-37.50
Heavy breakable cast..	26.50-27.50
Unstripped motor blocks	25.50-26.50
Brake shoes	30.50-31.50
Clean auto cast	43.00-44.00
No. 1 wheels	33.50-34.50
Burnt cast	31.50-32.50
Drop broken machinery	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00
R.R. malleable	41.00-42.00
Rails, 3-ft. and under	44.00-45.00
Rails, 18 in. and under	47.00-48.00
Rails, random lengths	40.00-41.00
Cast steel	34.00-35.00
Railroad specialties....	35.00-36.00
Uncut tires	36.00-37.00
Angles, splice bars	42.50-43.50
Rails, rerolling	42.00-43.00

Stainless Steel
(F.o.b. shipping point)

18-8 bundles, solids....	nom. 160.00-170.00
18-8 turnings .....nom.	70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting...	29.00-30.00
No. 2 heavy melting...	24.00-25.00
No. 1 bundles	29.00-30.00
No. 2 bundles	22.00-23.00
Machine shop turnings.	13.00-14.00
Short shovel turnings..	19.00-20.00
Cast iron borings	19.00-20.00
Low phos.	30.00-31.00
Electric furnace bundles	29.00-30.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting...	23.00
No. 2 heavy melting...	21.00
No. 1 bundles	24.00
No. 2 bundles	19.00
No. 1 busheling	23.00
Electric furnace bundles	25.00*
Machine shop turnings.	13.00
Mixed borings, turnings	15.00
Short shovel turnings..	17.00
Structurals & plate ...	29.00*
Heavy turnings	22.00
Couplers, springs, wheels	31.00
Rail crops, 2 ft & under	41.00

Cast Iron Grades

No. 1 cupola	*35.00*
Malleable	39.00
Heavy breakable cast..	35.50
Unstripped motor blocks	28.00*
Drop broken machinery	41.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting..	17.00-18.00
No. 2 heavy melting..	15.00-16.00
No. 1 bundles	17.00-18.00
No. 2 bundles	13.00-14.00
Machine shop turnings	5.50-6.00
Mixed borings, short turnings	*8.00-9.00*
Low phos. (structural & plate)	21.00-22.00
Short shovel turnings ...	*10.50-11.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00*

Stainless Steel

18-8 sheets, clips, solids	*170.00-175.00*
18-8 borings, turnings..	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	17.00
No. 2 heavy melting...	15.25-16.00
No. 1 bundles	17.00
No. 2 bundles	13.25-14.25
Machine shop turnings.	3.00-3.50
Mixed borings, turnings	5.50-6.00
Short shovel turnings..	7.25-7.50
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast..	32.00-33.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	25.00-26.00
No. 2 heavy melting...	22.00-23.00
No. 1 bundles	25.00-26.00
No. 2 bundles	19.00-20.00
No. 1 busheling	25.00-26.00
Machine shop turnings.	11.00-12.00
Mixed borings, turnings	13.50-14.50
Short shovel turnings..	13.50-14.50
Cast iron borings	13.50-14.50
Low phos., 18-in.	*32.00-33.00*

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast..	36.00
Charging box cast	36.00
Drop broken machinery	*45.00*

Railroad Scrap

No. 1 R.R., heavy melt.	29.00-30.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths..	37.00-38.00

CHICAGO

No. 1 heavy melting ...	*30.00-32.00*
No. 2 heavy melting	*28.00-30.00*
No. 1 factory bundles ...	*31.00-33.00*
No. 1 dealer bundles ...	*29.00-31.00*
No. 2 bundles	22.00-23.00
No. 1 busheling	*30.00-32.00*
Machine shop turnings	14.00-15.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings..	16.00-17.00
Cast iron borings	16.00-17.00
Cut structurals, 3-ft ...	*33.00-34.00*
Punchings & plate scrap	*33.00-34.00*
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Stove plate	32.00-34.00
Unstripped motor blocks	24.00-25.00
Clean auto cast	40.00-42.00
Drop broken machinery	41.00-42.00

Railroad Scrap

No. 1 R.R., heavy melt	33.00-34.00
R.R. malleable	40.00-42.00
Rails, 2-ft. and under.	44.00-45.00
Rails, 18-in. and under	45.00-46.00
Angles, splice bars	38.00-39.00
Rails, rerolling	41.00-43.00

Stainless Steel Scrap

18-8 clips & solids....130.00-140.00	
18-8 turnings	60.00
430 clips & solids	40.00-42.00
430 turnings	20.00-22.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	21.00
No. 2 heavy melting...	19.00
No. 1 bundles	23.00
No. 2 bundles	19.00
No. 1 busheling	21.50
Machine shop turnings.	10.00
Mixed borings, turnings	10.00
Short shovel turnings..	11.50
Punchings & plate scrap	24.00

Cast Iron Grades

No. 1 cupola	36.00
Charging box cast	27.00
Stove plate	29.00
Heavy breakable	26.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting...	25.00-26.00
No. 2 heavy melting ..	21.00-22.00
No. 1 bundles	*26.00-27.00*
No. 2 bundles	19.00-20.00
No. 1 busheling	25.00-26.00
Machine shop turnings.	14.00-15.00
Mixed borings, turnings	*17.50-18.00*
Short shovel turnings ...	*18.50-19.00*
Cast iron borings	*17.50-18.00*
Low phos.	*29.00-29.50*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	39.00-40.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths.	33.00-34.00
Rails, 3-ft and under..	40.00-41.00
Railroad specialties ...	34.50-35.50

BIRMINGHAM

No. 1 heavy melting...	19.00-20.00
No. 2 heavy melting..	22.00-23.00
No. 1 bundles	19.00-20.00
No. 2 bundles	15.00-16.00
No. 1 busheling	19.00-20.00
Cast iron borings	13.00-14.00
Short shovel turnings..	14.00-15.00
Machine shop turnings.	12.00-13.00
Electric furnace bundles	25.00-26.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-43.00
Charging box cast ...	28.00-29.00
Stove plate	39.00-40.00
Bar crops and plate...	28.00-29.00
Structural, plate 2 ft..	28.00-29.00
Heavy breakable cast..	28.00-29.00
Unstripped motor blocks	32.00-33.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	26.00-27.00
Rails, 18-in. and under	39.00-40.00
Rails, random lengths.	34.00-35.00
Rails, rerolling	34.00-35.00
Angles, splice bars ...	36.00-37.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting...	26.50
No. 2 heavy melting...	24.50
No. 1 bundles	26.50
No. 2 bundles	20.25
Machine shop turnings.	12.00
Short shovel turnings..	14.00

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	29.00
Heavy breakable cast..	29.00
Unstripped motor blocks	27.00
Brake shoes	30.00
Clean auto cast	39.00
Stove plate	*33.00*

Railroad Scrap

No. 1 R.R. heavy melt.	33.50
Rails, 18-in. and under	41.00
Rails, random lengths..	38.00
Rails, rerolling	45.50
Uncut tires	*32.50*
Angles, splice bars	33.50

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting...	23.00
No. 2 heavy melting...	19.00
No. 1 bundles	21.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings.	11.50
Mixed borings, turnings	11.50
Short shovel turnings..	11.50
Electric furnace, No. 1	35.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast..	25.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate (f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap
(Delivered consumer plant)

Rails, random lengths..	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting...	20.00
No. 2 heavy melting...	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings.	5.00
Mixed borings, turnings	5.00
Short shovel turnings..	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	*41.00-43.00*
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting...	20.00
No. 2 heavy melting...	16.00
No. 1 bundles	18.00
No. 2 bundles	14.00
Machine shop turnings.	5.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	40.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting...	$22.00
No. 2 heavy melting...	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory: Prepared	20.00
Unprepared	16.00
Short steel turnings....	12.00

Cast Iron Grades†

No. 1 machinery cast..	42.00-45.00

†F.o.b., shipping point.

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As president of a company which was among the first to offer its employees an opportunity to build for their future through the systematic investment in U.S. Savings Bonds, Mr. Kestnbaum is well qualified to evaluate the benefits of the Payroll Savings Plan:

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• *"a stabilizing factor in the economy"*: The month-after-month investment of millions of dollars in Savings Bonds by more than 8,000,000 enrolled Payroll Savers constitutes probably our strongest check on inflation.

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STEEL
THE WEEKLY MAGAZINE OF METALWORKING

(*Concluded from page* 159)

down, dealers are turning to exports to sustain sales. Closing of a major sheet mill has lessened the scrap movement. Small sales of No. 1 heavy melting are noted at $20.

Buffalo—Buying interest, both locally and from the Valley, boosted scrap prices up to $2 a ton here. Sales were reported in No. 1 heavy melting and blast furnace items at advances of $1 a ton. Low phos was up $2 a ton.

Seattle—The scrap market has again returned to a lethargic state Large buyers are not carrying big inventories as supplies on the open market are ample for immediate needs. Cast iron is slow and in good supply. Dealers would welcome export demand but Japan is short of dollars and no definite offshore market is available in this area.

San Francisco—No. 1 cupola cast moved up another notch last week to a range of $41 to $43 a ton. Indications are the price will go still higher. Demand is overwhelming supply, held down by the fact many small dealers have left the business because of the long stalemate in the market.

To Trade in Scrap Futures

Chicago—The Chicago Mercantile Exchange has announced it will establish a steel scrap futures market on or before Aug. 1. The deliverable contract will be for No. 1 heavy melting steel with No. 2 deliverable at a discount.

The period between now and the market opening will be used to complete details of the contract and prepare explanatory literature for the industry. It is stated by exchange officials that inspection of delivered contracts will be made by an independent organization under contract to the exchange.

Both the Chicago and Northern Ohio chapters of the Institute of Scrap Iron & Steel are on record in opposing futures trading in scrap.

Iron Ore . . .

Iron Ore Prices, Page 157

Cleveland—The movement of iron ore from the head of the lakes this year is running about 10 million tons behind the record shipments reported in the 1953 season.

In the week ended May 24 the lake fleet brought down 2,599,320 gross tons, according to the Lake Superior Iron Ore Association. This compares with shipments of 3,155,087 tons in the like week a year ago.

Total shipments in the 1954 navigation season to date now stand at 8,780,675 tons, comparing with 19,978,710 in the corresponding period of 1953.

Consumption of Lake Superior ore in April amounted to 5,286,731 gross tons. This was a decline compared with 5,931,800 tons in March, and with 7,764,189 tons in April last year.

Stocks of ore at furnaces and lower lake docks on May 1 totaled 26,142,131 gross tons. This compares with 30,587,462 on Apr. 1, and with 21,572,184 on May 1, 1953.

Pig Iron . . .

Pig Iron Prices, Page 144

New York—Blast furnace production was off in April, totaling 4,502,566 net tons compared with 4,959,303 in the preceding month and with 6,230,641 tons in April a year ago, reports the American Iron & Steel Institute.

Output for the month consisted of 4,449,289 tons of pig iron and 53,277 tons of ferromanganese and spiegeleisen. In March pig iron production amounted to 4,907,147 tons and ferroalloys, 52,156 tons, while in April a year ago 6,171,939 tons of pig iron were produced and 58,702 tons of ferroalloys.

Cumulative production in the first four months this year amounted to 19,851,936 net tons, consisting of 19,652,186 tons of pig iron and 199,750 tons of ferromanganese and spiegeleisen. In the like period last year total output was 25,353,903 net tons, consisting of 25,078,262 tons of pig iron and 275,641 tons of ferromanganese and spiegeleisen.

New York—Pig iron trading continues restricted, but on an even keel. This may continue throughout the greater part of June, with a decline likely to set in, as a result of vacations and hot weather.

Philadelphia—The Birdsboro, Pa. stack of the Colorado Fuel & Iron Corp. has been taken out of blast for extensive repairs. This drop in pig iron production, however, will be more than offset by resumption of operations next week at the three blast furnaces of Bethlehem Steel Co. at Steelton, Pa.

Cleveland — Spotty demand for merchant pig iron continues with foundries able to obtain prompt shipments from furnaces. They are

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not ordering much in the way of inventory, especially those shops that are operating on short weeks.

Youngstown—Youngstown Sheet & Tube Co. has blown in Jeannette blast furnace at its Brier Hill Works. This gives the company more hot metal to enable it to cut its open hearth heat time. The furnace was down for relining over a month.

Cincinnati — Foundries are optimistic about business although conditions have not bettered themselves materially in this field.

Chicago—Midwest foundry operations are losing none of their spottiness but requirements for pig iron are up somewhat over April. Vacation closings, however, will reduce iron intake during next two months.

Rails, Cars . . .

Track Material Prices, Page 143

Birmingham—Central of Georgia has placed an order with the Bessemer plant of Pullman-Standard Car Mfg. Co. for 500 fifty-ft box cars valued at approximately $3,500,000. The new business will mean reopening of the box car line as soon as materials can be assembled.

Ship More Steel by Water

Boston—Water shipment of steel from Baltimore to New England is reported increasing. Recently two 2500-ton shipments docked at Portland, Me., from the Sparrows Point, Md., mill, one arranged by the buyer and the second by Bethlehem Steel Co. Both lots went to Bancroft & Martin Rolling Mills Co., Portland.

Reinforcing bars made up the bulk of the tonnages, but some plates and sheets were included.

For some time water shipments have been made to New Haven, Conn., by Bethlehem Steel Co., mostly hot-rolled strip for two Connecticut converters.

Canada . . .

Toronto, Ont.—Production of iron and steel in Canada shows a marked decline from the record high of 1953. For March, pig iron output was 200,763 net tons comparing with 182,050 tons in February and 238,572 for March, 1953.

For the three months ending with March, 1954, production of pig iron totaled 597,812 net tons compared with 708,360 net tons in the like period of 1953.

Production of steel ingots and castings in March was 249,290 net tons comparing with 266,911 for February and 366,974 tons for March, 1953.

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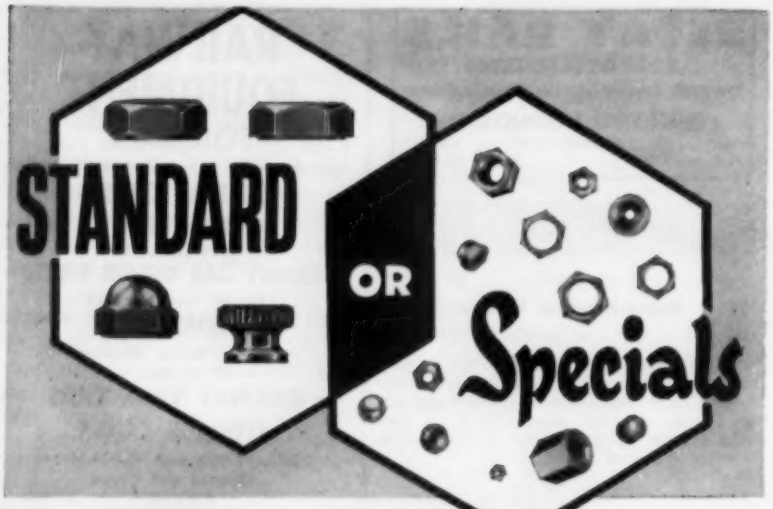

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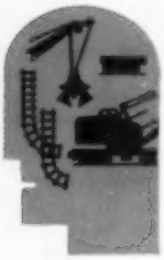

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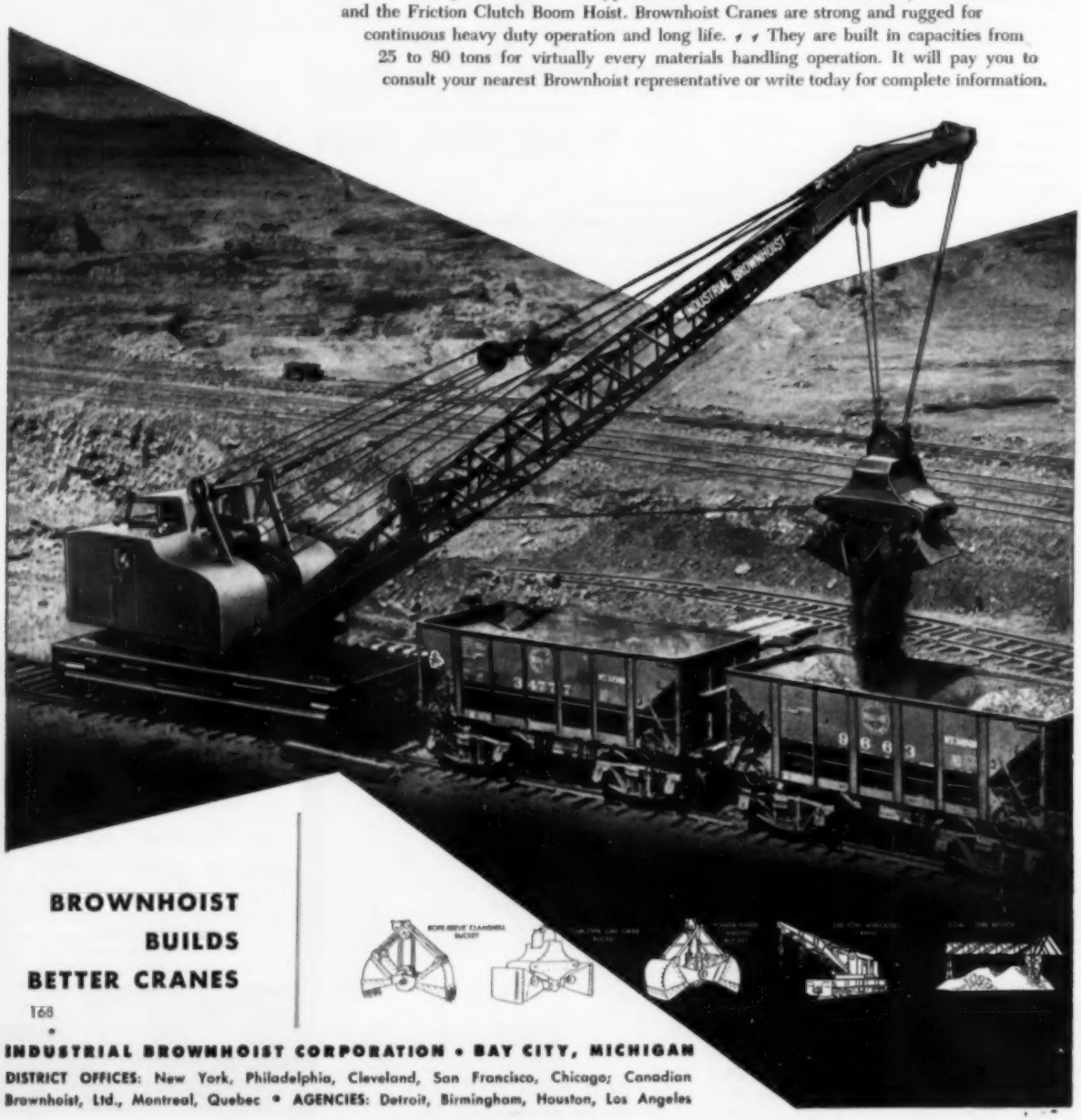

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Conveyor speed doubled, $12,000 labor saved with Farval

IN a plant with 110,000 feet of coal conveyor, the company employed 4 men per shift to hand-lubricate the 650 bearings on 17 conveyor drive units. Bearings frequently heated up or failed between oilers' visits. Other bearings were neglected while those in trouble were being nursed along. Conveyor speed had to be reduced and coal delivery slowed down.

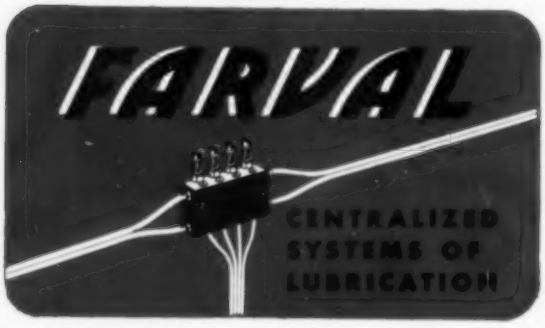
Then Farval was installed. Twenty-six manually operated centralized lubricating systems were adequate to serve the 650 bearings. Since then there has not been a single bearing failure due to lack of lubrication. Conveyor speed has been stepped up from 300 feet to 600 feet per minute, and coal delivery approximately doubled. And it requires only 2 men per shift to operate the 26 Farval systems—an annual saving in oiling labor alone of more than $12,000.

Thousands of Farval Centralized Systems of Lubrication have been installed in industry. In coal preparation plants, for example, Farval serves Conveyors, Feeders, Crushers, Shakers, Vibrating Screens, Elevators, Washers, Jigs, Dryers, Mixers, Loading Booms and Drives.

Farval is the original (patented) Dualine system of centralized lubrication that has proven itself through years of service. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its wide valve parts and full hydraulic operation, Farval unfailingly delivers grease or oil to each bearing—as much as you want, exactly measured—as often as desired. Indicators at every bearing show that each valve has functioned.

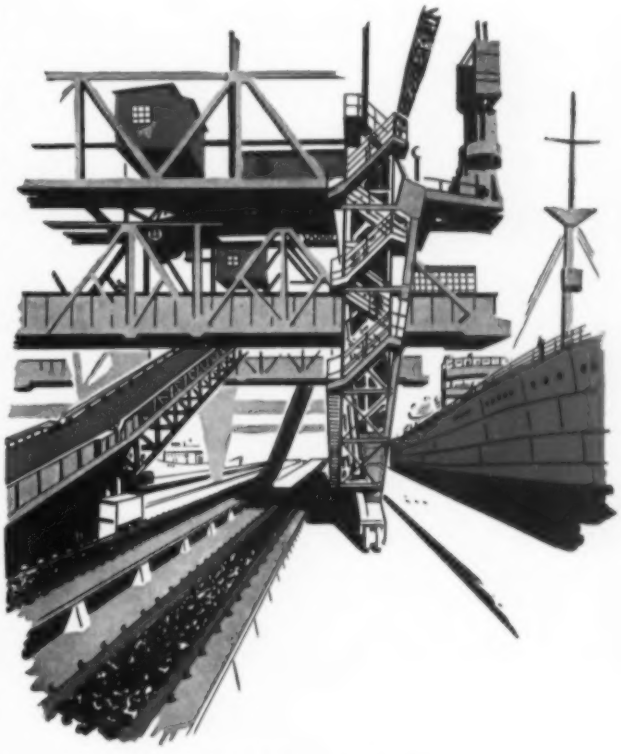
Write for Bulletin 26 for full details. The Farval Corporation, 3270 East 80th St., Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



HERE'S PROOF!

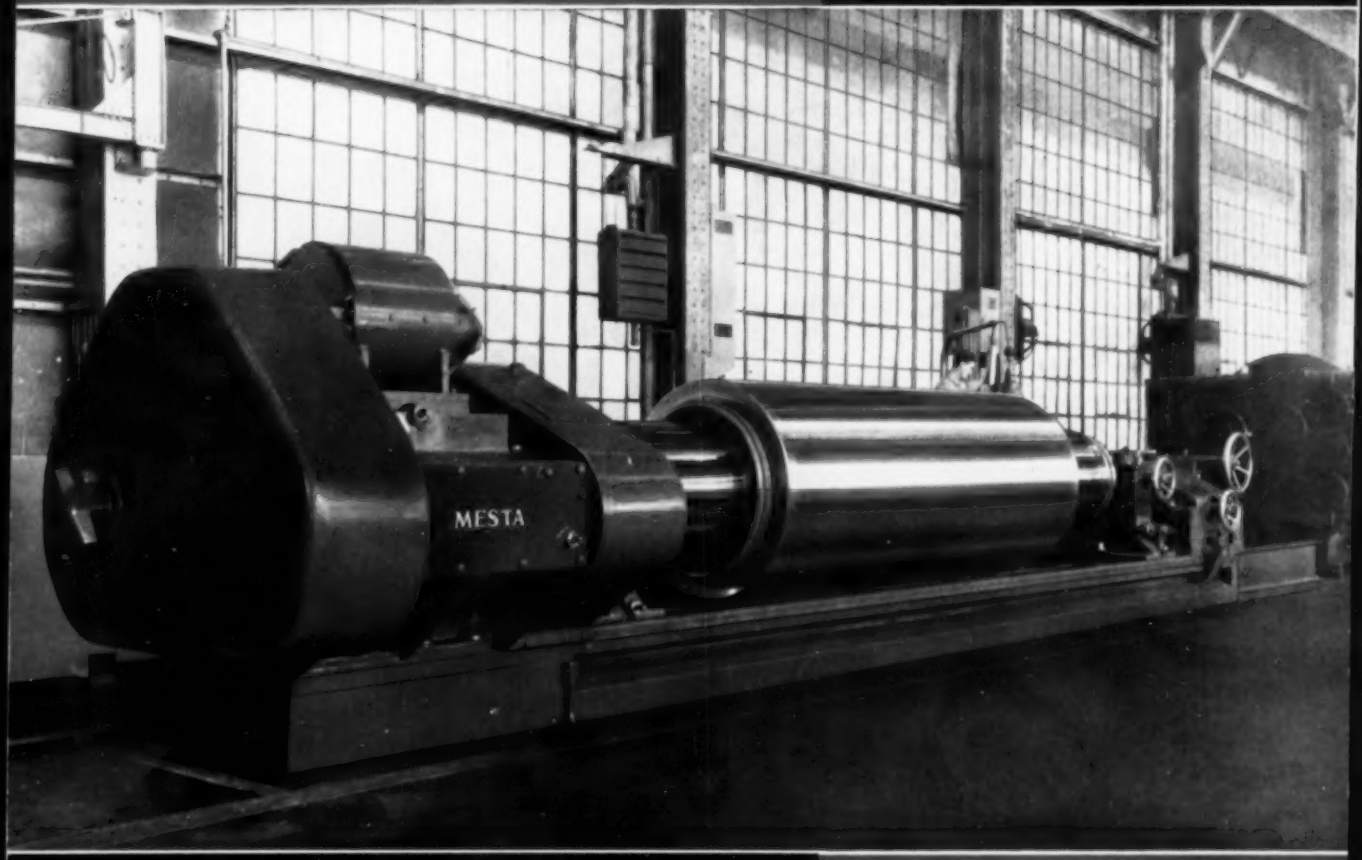
This advertisement was published previously in 1947, when the Farval systems described had been in service only six years. Now, seven years later, these same systems are still in service, still performing satisfactorily, still saving labor and money—many of them on coal handling units operating 16 to 24 hours a day, winter and summer.



FARVAL—*Studies in Centralized Lubrication No. 92*

Heavy Duty ROLL GRINDERS

Designed and Built by MESTA



Mesta Heavy Duty Traveling Wheel Type Roll Grinder
Finishing a 59" x 154" Mesta Backing-Up Roll

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY • PITTSBURGH, PA.